Draft Environmental Impact Statement for the Ely Energy Center Volume 2

NV-040-09-001 EIS

DES 08-42

U.S. Department of the Interior
Bureau of Land Management
Ely District Office
Nevada

BLM

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Draft EIS

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Chapter 4
Environmental Consequences

4.1 Impact Assessment

The Proposed Action and Alternatives outlined in Chapter 2 may cause, directly or indirectly, changes in the human environment. This EIS assesses and analyzes these potential changes and discloses the effects to the decision-makers and public. This process of disclosure is one of the fundamental aims of NEPA. There are many concepts and terms used when discussing impacts assessment that may not be familiar to the average reader. The following sections attempt to clarify some of these concepts.

4.1.1 Impacts/Effects

The terms "effect" and "impact" are synonymous under NEPA. Effects may refer to adverse or beneficial ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the Proposed Action or Alternatives (40 CFR 1508.8). Effects may be direct, indirect, or cumulative in nature. Cumulative effects will be analyzed in Chapter 5.

4.1.2 Direct Effects

A direct effect occurs at the same time and place as the action (40 CFR 1508.8(a)). Direct and indirect effects are discussed in combination under each affected resource.

4.1.3 Indirect Effects

Indirect effects are reasonably foreseeable effects that occur later in time or are removed in distance from the action (40 CFR 1508(b)). Direct and indirect effects are discussed in combination under each affected resource.

4.1.4 Significance

The word "significant" has a very particular meaning when used in a NEPA document (40 CFR 1508.27). Significance is defined by CEQ as a measure of the *intensity* and *context* of the effects of a major federal action on, or the importance of that action to, the human environment. Significance is a function of the beneficial and adverse effects of an action on the environment.

Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining intensity of effect. This EIS will primarily use the terms Major, Moderate, Minor, or Negligible in describing the intensity of effects.

Context means that the effect(s) of an action must be analyzed within a framework, or within physical or conceptual limits. Resource disciplines; location, type, or size of area affected (e.g., local, regional, national); and affected interests are all elements of context that ultimately determine significance. Both long- and short-term effects are relevant.

4.1.5 Indicators

Impact indicators are the consistent currency used to determine change (and the intensity of change) in a resource. Working from an established existing condition (i.e., baseline conditions described in Chapter 3) this indicator would be used to predict or detect change in a resource related to causal effects of proposed actions.

4.1.6 Environmental Effect Categories

The following environmental effect categories (**Table 4.1-1**) are presented to define relative levels of effect intensity and context for each resource that is analyzed in this Chapter and to provide a common language when describing effects.

TABLE 4.1-1. SUMMARY OF TERMS USED TO DESCRIBE EFFECTS IN THE EIS

ATTRIBUTE OF EFFECT		DESCRIPTION
Magnitude (Intensity)	Negligible	A change in current conditions that is too small to be physically measured using normal methods or perceptible to a trained human observer. There is no noticeable effect on the natural or baseline setting. There are no required changes in management or utilization of the resource.
	Minor	A change in current conditions that is just measurable with normal methods or barely perceptible to a trained human observer. The change may affect individuals of a population or a small (<10 percent) portion of a resource but does not result in a modification in the overall population, or the value or productivity the resource. There are no required changes in management or utilization of the resource.
	Moderate	An easily measurable change in current conditions that is readily noticeable to a trained human observer. The change affects 25 to 75 percent of individuals of a population or similar portion of a resource which may lead to modification or loss in viability in the overall population, or the value or productivity the resource. There are some required changes in management or utilization of the resource.
	Major	A large measurable change in current conditions that is easily recognized by all human observers. The change affects more than 75 percent of individuals of a population or similar portion of a resource which leads to significant modification in the overall population, or the value or productivity the resource. There are profound or complete changes in management or utilization of the resource. An impact that is not in compliance with applicable regulatory standards or thresholds.
Duration	Transient/Temporary	Short-lived (i.e., during construction)
	Short-term	10 years or less
	Long-term	More than 10 years

4.1.7 Mitigation

Where applicable, mitigation measures are proposed in this document. Mitigation measures are solutions to environmental impacts that are applied in the impact analysis to reduce intensity or eliminate the impacts. To be adequate and effective, CEQ rules (40 CFR 1508.20) require that mitigation measures fit into one of five categories:

(a) avoiding the impact altogether by not taking a certain action or parts of an action;

(b) minimizing impacts by limiting the degree or magnitude of the action and its implementation;

(c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or

(e) compensating for the impact by replacing or providing substitute resources or environments.

4.2 Water Resources

4.2.1 Indicators and Methods

As discussed in **Section 3.2.2**, issues associated with water resources can be grouped into two categories: permanent and temporary surface disturbance, which occurs throughout the project area; and water supply usage, which is limited to Steptoe Valley. The following indicators have been identified to address impacts regarding these potential effects, including their potential project activity cause:

- Suspended sediment concentration, turbidity, pH, and contaminants of concern in downgradient streams, ponds, and other surface waters, with regards to applicable surface water quality standards (Surface Disturbance)
- Concentrations of contaminants of concern in groundwater under and downgradient from coal stock piles, fly ash piles, and landfills (Surface Disturbance and Water Supply)
- Changes in volume and timing of surface water runoff (Surface Disturbance)
- Aquifer recharge rate (Surface Disturbance and Water Supply)
- Water rights/permits located down-gradient of surface water diversions for the project and located within the groundwater drawdown area of the project (Water Supply)
- Acres of playas and seasonally wet basins located down-gradient of surface water diversions for the project and located within the groundwater drawdown area of the project (Water Supply)
- Quantity, frequency, and quality of storm water and waste water releases (Surface Disturbance)
- Projected frequency, extent, and duration of flooding as a result of surface water runoff (Surface Disturbance)

In order to compare effects associated with the Proposed Action and Action Alternative project elements, these indicators were considered both independently and in conjunction with one another. Indirect effects of emission pollutants on surface water and groundwater resources are discussed in detail in **Section 4.6.2.1**.

4.2.1.1 Wetlands and Waters of the United States

Delineation of waters of the United States, including wetlands, was conducted for this project by JBR (2007a). A formal determination from the United States Army Corps of Engineers (the Corps), in order to establish which, if any, of these waters is jurisdictional under the CWA, has not been completed as of the writing of this document. Therefore, it is assumed all waters and wetlands mentioned here are jurisdictional under the CWA until otherwise directed by the Corps (or other appropriate regulatory agency). Concurrent with guidance received from the Corps regulatory office in Reno, Nevada as part of the delineation associated with the NNRy (Frontier 2007), ephemeral washes and intermittent streams lacking a direct surface water connection with the perennial reach of Duck Creek are not considered jurisdictional and are treated accordingly here.

4.2.1.2 Groundwater Modeling

Groundwater modeling conducted by EMS-I (2008) evaluated drawdown scenarios on 1-, 5-, 10-, 25-, and 50-year periods for an array of six wells located near Lages Station as part of the Proposed Action (discussed in **Section 4.2.2.3**), as well as five other water supply alternative scenarios (discussed in **Sections 4.2.2.3** and **4.2.3.3**). A copy of the groundwater modeling report and a summary are included on the DEIS distribution CD. Information on the stratigraphy of Steptoe Valley from existing well logs and previous studies suggests that the valley fill aquifer has variable hydraulic properties in the vertical and horizontal dimensions; however, there is little data on the deeper stratigraphy of the valley due to the lack of deeper wells with detailed well logs (Mayo 2007a). This lack of stratigraphic and quantitative hydraulic data does not support more complex modeling of the northern Steptoe Valley with a multi-layer model (EMS-I 2008) for the groundwater impacts analysis. Therefore the model developed for evaluating the impacts of the Proposed Action and Action Alternatives on Steptoe Valley groundwater consisted of a single-layer domain, or one unconfined aquifer. The single-layer model is a conservative approach and likely overestimates potential drawdown effects compared to a multi-layered model. The model domain includes the valley fill aquifer that would be the immediate source of groundwater for the proposed pumping scenarios and therefore would experience the greatest impacts. The mountains bounding the valley are the principal recharge areas for the valley fill aquifer, and this recharge was estimated and distributed along the boundaries of the model to simulate movement of water from the mountains down into Steptoe Valley (EMS-I 2008). In addition to the single-layer approach, the grid spacing regime and discretization (size and shape of the model grid) utilized for this modeling effort also produces predicted contours that likely overestimate drawdown effects, particularly along the margins of the model domain. Drawdown effects were predicted by the model and were contoured on maps out to the 1-foot drawdown value.

In all groundwater pumping scenarios/alternatives, it was assumed that well locations, water rights, and pumping regimes would be approved by the Office of the Nevada State Engineer, which is a separate decision from that described in this EIS for the BLM.

4.2.2 Proposed Action: South Plant Site

The South Plant Site is located approximately 5 miles north of McGill, Nevada, within Steptoe Valley basin. Transmission lines extending from the site would cross Duck Creek to the northwest and White River in Nye County. Water supply for the South Plant Site would be provided via groundwater pumping from private water rights located near Lages Station in northern Steptoe Valley and delivered via underground pipeline from Lages Station south to the South Plant Site.

4.2.2.1 Direct and Indirect Effects on Water Resources from Plant Site Construction

<u>*Surface Water Resources*</u>

As described in **Section 2.2.1.1**, the project is being designed as a "zero-discharge" facility, where industrial wastewater and contact storm water would be captured onsite and stored in lined evaporation basins, while offsite runoff would be routed around the facility via a series of perimeter dikes and diversions. These evaporation ponds and diversions would be developed at the onset of construction to meet the zero-discharge requirements. Sanitary wastewater would be collected on site and trucked off site to permitted, publicly owned treatment works (POTWs) during the construction phase.

During the construction phase of the project, reaches of four unnamed, ephemeral washes totaling approximately 5 miles in length and located in the northeast quadrant of the plant site would be diverted to the edge of the plant site boundary. The reaches within the plant site would be permanently disturbed; however, flow rates, sediment transport, and water quality would be retained within the relocated channels downstream of the plant site. Direct effects to surface hydrology downstream of the plant site due to construction are anticipated to be long-term and minor, where only minimally detectable changes would occur in a small percentage of wash ecosystems in Steptoe Valley. No indirect effects are anticipated.

Construction of the associated worker village is not anticipated to impact any surface water resources. A man-made ditch flowing into a small impoundment is located in the eastern half of the private property where the worker village would be located; however, field inspections during summer 2007 gave the impression that these features had been dry for some time. The worker village would be oriented to avoid impacts to these features to the extent possible. Sanitary wastewater from the worker village would be treated in a package treatment plant or buried septic tanks and the treated wastewater would be disposed of in subsurface leach lines.

Construction of the Mt. Wheeler Transmission Line would cross three potentially jurisdictional waters of the United States, including Duck Creek (**Section 3.2.3.3**). Each of the crossing locations are proposed to be less than 10 feet in width. Impacts to these channels would be avoided by spanning the channels with the line, by locating structures outside of the channel area, and by implementing BMPs for erosion control. Culverts under existing access roads would be repaired or replaced near the crossing locations if necessary. There is not anticipated to be any effect on these channels due to construction of the Mt. Wheeler Transmission Line. There are no wetlands adjacent to any of the three channels proposed for crossing; therefore, wetland impacts would not occur as a result of the Mt. Wheeler Transmission Line.

BMPs would be implemented at all locations to avoid and/or minimize surface water quality impacts during the construction phase. Short-term, minor indirect effects may include the degradation of seasonal aquatic habitat for wildlife through altered hydrology, vegetation removal, or soil compaction. Minor impacts would affect only a small portion of surface water resources in Steptoe Valley, and these impacts would not likely change the overall availability of ephemeral wash ecosystems on the valley floor.

<u>*Groundwater Resources*</u>

Groundwater quality would not be directly or indirectly affected by the construction of the South Plant Site, the associated worker village, or the Mt. Wheeler Transmission Line. Effects to groundwater availability associated with water supply to the plant site are discussed in detail below.

Operations, Maintenance, and Abandonment

<u>*Surface Water Resources*</u>

As described above, the Proposed Action would be designed as a zero-discharge facility. Process wastewater and contact storm water produced throughout the life of plant would be recycled or captured on site in evaporation basins and ponds fitted with synthetic membrane liners. Basins would have perimeter dikes and leak detection systems to prevent movement of contained water to either off-site surface water resources or groundwater resources. The combustion byproducts landfill would also be built with a synthetic liner system to prevent escape of leachate from the ash into the subsurface. Runoff from the landfill would also be routed to lined evaporation ponds. Sanitary wastewater would be treated on site in a package

treatment plant and disposed of in an on-site subsurface leach field. As part of mitigation a groundwater monitoring plan specific to the plant site would be developed that identifies significant impacts associated with unexpected failure of the liner systems (see **Section 4.2.2.5** for additional details). Off-site surface runoff that would normally enter the site boundary would be routed around the perimeter of the site, with matching pre- and post-discharge rates and volumes to prevent alterations in downstream hydrology, water quality, or flood dynamics. Direct effects to surface hydrology are anticipated to be long-term and minor because only a small portion of the ephemeral wash systems in Steptoe Valley would be impacted. Wetlands and designated floodplain areas are not present within the South Plant Site boundary and would therefore not be impacted.

The associated worker village would be a temporary feature to be utilized only during the construction phase, and would therefore not have any long-term impacts on water resources. Upon abandonment of the worker village, the surface of the site would be restored to pre-project conditions.

Operations, maintenance, and abandonment impacts to surface water resources of the Mt. Wheeler Transmission Line would be limited to periodic use of the existing maintenance road located within the ROW or adjacent to the line. Erosion impacts to surface water channels present in the line ROW would be avoided and minimized by the implementation of BMPs during any maintenance activity. These impacts would be short-term and negligible.

As described in **Section 4.6**, emissions from coal-fired power plants could include nitrogen and sulfur compounds. These potential air pollutants are transported in the atmosphere and deposited on the land surface through various means. Nitrogen and sulfur enter surface water systems through the process of wet and dry atmospheric deposition. This can occur as a direct deposition where the pollutant falls directly into the water body or as an indirect deposition where the pollutant has fallen onto a terrestrial environment and then is transported, via run-off, into a surface water body (EPA 2002). This indirect deposition occurs when soils and vegetation are unable to take up and store the excess deposition of these compounds. The early spring is usually when the overloading of the system occurs during the spring snowmelt period prior to the time when vegetation actively utilizes nitrate (Simonin 1997). When nitrate and sulfur compounds enter a surface water system, the available buffering chemicals in the water react with the pollutants. Depending on the concentrations of the pollutants in the water, and natural ability of the water chemistry to buffer the effects of the pollutants, the addition of the pollutants can result in a decrease in pH of the water. The more nitrate and sulfur deposition that occurs the lower the pH can become.

Concentrations of arsenic, mercury, and other chemicals contained in the power plant exhaust that could be deposited in surface water resources within 50 kilometers of the EEC plant site were analyzed in a risk assessment that is described in **Section 4.6** of this EIS.

Groundwater Resources

The operation, maintenance, and abandonment of the South Plant Site, associated worker village, and Mt. Wheeler Transmission Line would not directly or indirectly affect groundwater quality. Impacts to groundwater levels associated with water supply to the plant site are discussed in detail below.

4.2.2.2 Direct and Indirect Effects on Water Resources from Electric Transmission Facilities

Construction

Surface Water Resources

Electric transmission facilities would extend from the South Plant Site northwest across Duck Creek, then south through the Robinson Summit Substation, across Ellison Creek and White River in White Pine County, and continue on to the Harry Allen Substation expansion in Clark County. Waters of the United States, including wetlands, are present at these proposed crossing locations.

Sanitary wastewater produced along the transmission line construction project would be managed with portable facilities and sanitary waste would be trucked to a POTW for disposal.

A sizeable unnamed wash flowing into the closed basin of Jakes Valley occurs in the southern half of the Robinson Summit Substation location. Portions of this wash that would be impacted by the construction of the substation would be rerouted along the perimeter of the facility in order to maintain hydrology and sediment transport. This routing would remain in place for the life of the facility. Appropriately-sized and located culverts would be placed at any necessary crossing locations of the wash. BMPs would be utilized to prevent water quality degradation of runoff during the construction phase.

The Segment 4A, EEC-RS #1 Line wetland crossing of Duck Creek would be approximately 810 linear feet (lf), while the EEC-RS #2 Line crossing would be 730 linear feet and then 210 linear feet as the Line 2 sections would be separated by approximately 410 linear feet of upland area where a transmission pole could be located via helicopter, or, alternatively, the entire 1,350 linear feet could be spanned. In either case, construction impacts to wetlands and/or waters of the United States at this location would be avoided.

Segment 3, an alternative to Segment 4A, would exit the South Plant Site on the south side, proceed briefly west, then turn south towards the existing Falcon to Gonder transmission line, crossing Duck Creek approximately 4 miles southwest of the South Plant Site. A small wetland area is present within the Segment 3 alignment south of the South Plant Site; however, impacts to this wetland would be avoided by spanning the width of the wetland area with the transmission lines.

Within the Steptoe Slough portion of Segment 3, the Line 1 wetland crossing of Duck Creek is approximately 1,950 linear feet, while the Line 2 crossing is 2,130 linear feet. In both cases, construction impacts to wetlands and/or waters of the United States at this location would occur due to installation of transmission line poles. One pole and one stringing site would be required within the delineated wetland boundary per line. Total temporary impacts would be 9.4 acre, and total permanent impacts would be 0.2 acre Temporarily-impacted areas would be restored to pre-existing conditions upon completion of construction. A CWA Section 404 Individual Permit would be required from the Corps for these impacts which by definition are significant. The delineation of wetlands in Steptoe Slough took place during a period immediately following above-average precipitation and snowpack years, and therefore crossing lengths likely estimate the maximum possible impacts that would occur. During a re-evaluation of Steptoe Slough in spring and summer 2008, it appears that this area fluctuates significantly based on the available surface water that is input into the system from Duck Creek, Tailings Creek, and McGill Spring (JBR 2008b). While the crossing length in wetland areas may be less than the 1,950 and 2,130 linear feet, it is still likely that an Individual Permit would be required due to temporary

construction impacts; however, total permanent impacts in wetland areas may be less than the stated 0.2 acres.

Within Segment 6C, a small stream from Warm Springs crosses the proposed alignment, eventually flowing downstream into Ellison Creek and, ultimately, the White River. This crossing is less than 40 linear feet at its widest margin and would therefore be spanned. Segment 6C crosses the White River (and adjacent wetlands) immediately south of the Kirch WMA. The RS-HA #1 Line crossing would be approximately 810 linear feet and the RS-HA #2 Line crossing would be approximately 100 linear feet. These segments would be spanned to avoid impacts to wetlands and/or waters of the United States.

Access for construction of electric transmission facilities would generally be along existing roads and two-tracks. Should these existing roads require improvement resulting in wetland impacts, a Section 404 permit would be required from the Corps prior to construction. In the event transmission line stringing locations would cause impacts to wetland areas during construction, this would also require a permit. The Corps' Nationwide Permit No. 12 – Utility Line Activities could be employed for project impacts to jurisdictional wetlands totaling less than 0.5 acre If impacts greater than 0.5 acre would occur, then a Corps Individual Permit would be required. Also, significant BMPs would be implemented within all segments to avoid and/or minimize surface water quality impacts during the construction phase.

Special flood hazard areas are present within portions of alternative Segment 3 in White Pine County, Segment 6C in Nye County, and in Segment 11 in Clark County. Alternative Segment 3 would require the permanent placement of two transmission line poles within a special flood hazard area, totaling 0.2 acre of permanent impact. While minimal, this impact would change the potential for flooding in this area. Other remaining areas would be spanned by transmission lines to the extent possible, and the placement of transmission line poles would be such as to prevent changes to flooding or erosion potential.

Adverse impacts to surface waters and wetlands as described above would be temporary and negligible to minor if all such waters can be spanned with no construction disturbance to the surface waters, and BMPs are uniformly followed. Impacts to wetlands that cannot be avoided, but that fall within the allowances of Nationwide Permit No. 12 – Utility Line Activities, would be temporary and minor for construction related disturbances. These impacts would affect a small portion of the wetland resources in the project area, but would not substantially degrade their function. If impacts to wetlands exceed the limits allowable under the Nationwide Permitting program, such that an Individual Permit is required, these impacts would be temporary and moderate. Impacts requiring an Individual Permit could result in adverse impacts to the function of wetland resources in the affected project areas, both during and following the construction period. No other surface water resources are present within the Proposed Action electric transmission facilities.

<u>*Groundwater Resources*</u>

The construction of the electric transmission facilities would not affect groundwater resources.

Operations, Maintenance, and Abandonment

<u>*Surface Water Resources*</u>

In the event that a maintenance access road to a transmission line was deemed necessary in a wetland area during the service life of the project, this activity could be permitted under either Nationwide Permit No. 12 – Utility Line Activities (if the road was not previously permitted) or under Nationwide Permit No. 03 – Maintenance (if the road was permitted during construction).

However, no impacts to surface water resources as a result of the Proposed Action electric transmission facilities are anticipated.

<u>Groundwater Resources</u>

The operation, maintenance, and abandonment of the electric transmission facilities would not affect groundwater resources.

4.2.2.3 Direct and Indirect Effects on Water Resources from Water Supply Facilities

Construction

<u>*Surface Water Resources*</u>

During the construction phase, a water supply pipeline for plant operation would be installed from Lages Station in north Steptoe Valley south to the South Plant Site. This pipeline would be subsurface and constructed via linear trenching. A number of dry, ephemeral washes would be temporarily disturbed during construction. After construction is complete, surface topography would be returned to pre-existing conditions to maintain surface water flow paths. The pipeline would be buried sufficiently deep so as to not affect water flow or erosion processes (scouring) in the bottom of these drainages. A permanent maintenance access road is proposed for the pipeline ROW (discussed below). Direct effects to water resources as a result of the water supply pipeline construction would be limited to the temporary disturbance of ephemeral washes. BMPs would be implemented along the pipeline construction ROW to avoid and/or minimize surface water quality impacts during the construction phase. Sanitary wastewater produced along the pipeline construction project would be managed with portable facilities and sanitary waste would be trucked to a POTW for disposal. Short-term, minor indirect effects may include the degradation of seasonal aquatic habitat for wildlife through altered hydrology (temporary culverting of ephemeral wash systems during construction), vegetation removal (see **Section 4.7**), or soil compaction.

<u>*Groundwater Resources*</u>

In addition to the water supply pipeline, one well would be developed within the plant site boundary for construction water. This well would be pumped at an average annual rate of 174 GPM (282 AFY) during the four-year construction period and then at about 6.2 GPM (10 AFY) thereafter for domestic water supply use for the plant. According to groundwater modeling conducted by EMS-I (2008), less than 1 foot of drawdown would occur as a result of this well development. Direct effects associated with this well during construction would be negligible.

Operations, Maintenance, and Abandonment

<u>*Surface Water Resources*</u>

The water supply pipeline would be constructed at a sufficient depth below ground surface so as to prevent interruption to natural runoff and/or erosion patterns during regular operation. A permanent maintenance access road would be constructed along the water supply pipeline ROW from Lages Station to the South Plant Site. This road would cross several unnamed ephemeral washes. Where washes are proposed to be crossed, appropriately-sized culverts would be installed to maintain hydrology and natural flow paths and to prevent localized flooding except under extreme storm events. The maintenance road and associated culverts would be removed upon abandonment of the facility.

Groundwater Resources

As indicated above, the construction well on the South Plant Site would be converted to potable use upon completion of plant construction. According to groundwater impact modeling conducted by EMS-I (2008), less than 1 ft. of drawdown would occur after 50 years of pumping from this location. Drawdown effects from this well on groundwater resources would be long-term and negligible.

Lages Station Well Field

Long-term operation of the plant site would require approximately 8,000 AFY of water, to be supplied via groundwater pumping from six wells located on private land in the vicinity of Lages Station as part of the Proposed Action. According to groundwater modeling conducted by EMS-I (2008) the maximum drawdown in the proposed Lages Station Well Field was predicted to be 15.3 feet at well EEC-5 with an initial depth to water at that location of 60 feet. Average maximum drawdown for all the water supply wells at the Lages Station Well Field was 9.8 feet. An area with one or more feet of drawdown extended to about 7 miles to the southwest of the Lages Station Well Field and about 8 miles to the northwest of the well field. The north-south extent of the 1-foot or greater drawdown along the west boundary of the model was about 12 miles. Drawdown greater than about 3 feet was localized to the general area of the well field and the area northeast of the well field (**Figure 4.2-1**). These drawdowns in the well field area would be long-term and minor to moderate impacts.

Springs, Streams, and Lakes

One of the primary concerns regarding groundwater pumping effects includes impacts to surface water resources including seeps, springs, and streams. A spring complex is located west of Goshute Lake and Lages Station on the alluvial fan fronting the east side of the Cherry Creek Range. These springs discharge water to surface channels that provide water for wildlife and local agriculture. Water in these channels flows downslope from the springs toward the Duck Creek channel in the bottom of Steptoe Valley. Due to loss through infiltration and ET, perennial surface flow in these side channels does not typically reach the Duck Creek channel. The elevation of these Goshute Lake area springs is about 15 to 20 feet above the lowest elevation of the central valley floor to the east of the springs. The springs discharge in this manner because the alluvial fan groundwater tables supplying the springs slope from west to east and intercept the land surface at the location of the springs before these groundwater systems interconnect with the valley bottom aquifer. Therefore, these springs are supplied by water from the alluvial fans to their west and not from the valley fill aquifer. Isotopic data obtained from water samples from these springs and from the deep valley fill aquifer indicate that the spring water is modern whereas water in the deep valley fill aquifer which would supply the Lages Station Well Field is much older (Mayo 2007a). According to Mayo (2007b), because these springs discharge well above the valley floor, and because the isotopic analysis indicates significantly differing water ages and sources between the springs and the valley fill aquifer, the flows at these springs are apparently supplied by different aquifers than the valley-fill aquifer and would therefore not be affected by the proposed pumping regime in the valley fill aquifer. Similarly, localized wetlands created as a result of these spring flows would not be affected by groundwater pumping associated with the Proposed Action. Since these springs would not see reduced flows, impacts to such sensitive species as the Northern Steptoe springsnail (*Pyrgulopsis serrata*) and other species of springsnails present in Steptoe Valley would not occur as a result of the groundwater pumping.

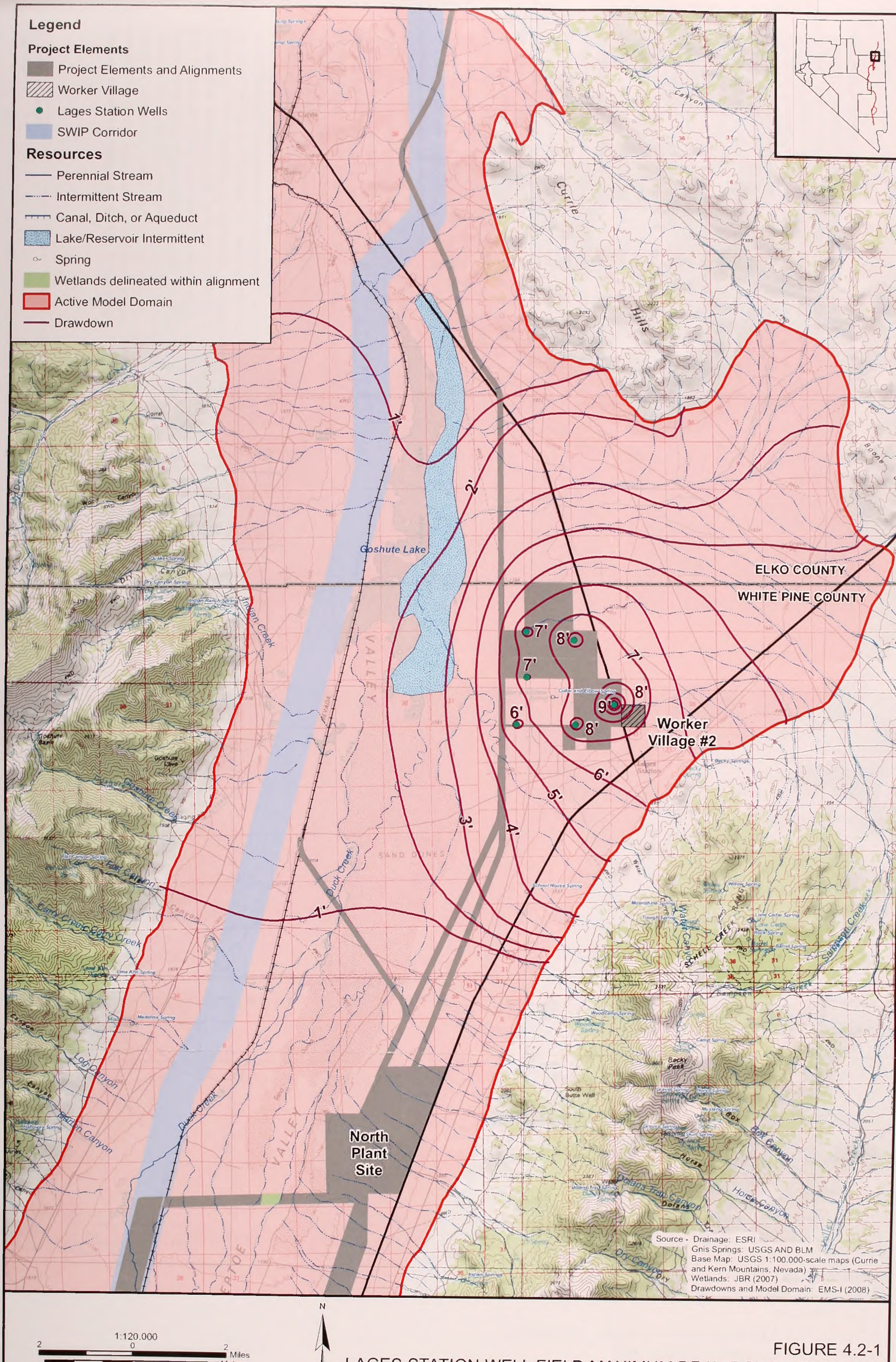

FIGURE 4.2-1
LAGES STATION WELL FIELD MAXIMUM DRAWDOWN - 50 YEARS
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In addition to the springs located on the western alluvial fan, a number of higher-elevation springs occur within the bounding mountain ranges on the eastern and western sides of Steptoe Valley. These bedrock springs support the base flow of such mountain streams as Schellbourne Creek, Big Indian Creek, Cherry Creek, Goshute Creek, and McDermid Creek (among others), providing recharge to the unconfined alluvial fan aquifers of the valley fill aquifer (Mayo 2007a). The April 2007 water table map (EMS-I 2008) shows the depth to water in the valley bottom groundwater system along the perimeter of the modeled valley fill aquifer as 200 to 250 feet below ground surface (bgs). Elevations of most mountain springs and streams are hundreds to thousands of feet above the alluvial fans. This large elevation difference between the top of the water surface in the valley fill aquifer and the mountain springs and streams indicate the mountain springs and streams are not supplied by water from the valley fill aquifer and would not be affected by pumping water from the valley fill aquifer (Mayo 2007b). The rapid infiltration of stream waters, often near the head of alluvial fans, supports the idea that these mountain streams do not have hydraulic communication with the valley fill aquifer groundwater to be pumped as part of the Proposed Action.

The Proposed Action drawdown contours show less than 2 feet of drawdown beneath the northern, ephemeral reach of Duck Creek and Goshute Lake. The April 2007 water table map shows the depth to water under Goshute Lake as 50 feet or less bgs, and digital files associated with the groundwater model indicated that the water table is typically 10 feet or more bgs along the Duck Creek channel (EMS-I 2008). Duck Creek becomes a broad plain of small, braided ephemeral channels north of Cherry Creek Highway until it discharges to Goshute Lake. Goshute Lake is typically dry, sometimes sufficiently so to drive a vehicle on (Frick 1985). During late spring 2007, Goshute Lake was observed to be a dry field of primarily inland saltgrass (*Distichlis spicata*), and Duck Creek was dry at Cherry Creek Highway. These field observations and the water table data suggest that the small predicted drawdowns associated with the Proposed Action would not result in reduced flow in Duck Creek, nor would they affect occasional periods of temporary inundation in Goshute Lake during unusually high surface runoff conditions. This assumption of no effects is predicated on the fact that the groundwater table in the valley bottom is not close enough to the land surface to affect surface water occurrence in the northern reaches of Duck Creek or Goshute Lake. While saltgrass is considered primarily a phreatophytic (deep-rooted) plant, Bolen (1964) observed that "saltgrass communities in western Utah are the most tolerant to saline habitats and variations in soil moisture of four emersed-soil [sic] community studies." Additionally, Bolen (1964) observed that plant zones affected by water recessions in summer months (such as the seasonally inundated areas of Goshute Lake) are transitory habitats, undergoing continual modification and indeterminate vegetative change. Bradley (1970) observed saltgrass presence most predominantly in phreatophytic communities, but also noted its presence in such xeric habitats as desert shrub communities in Saratoga Springs, CA. Hansen et al. (1976) noted that the rhizomous root structure of saltgrass is adapted to transport water, air, and nutrients considerable distances until sufficient soil moisture is encountered, at which time adventitious roots extend downward to meet the plant's water supply need. If the valley bottom unconfined aquifer water table of the valley fill aquifer is within the root zone of phreatophytic (deep-rooted) plants in the Goshute Lake area, the predicted water level declines could impact these areas. However, since only small portions of Goshute Lake appear ephemerally wet; the predicted drawdowns of the water table under the lake are 1 to 2 feet; and because saltgrass is highly adapted to varying habitat conditions, these impacts would be long-term and negligible to minor.

Water Rights

Because drawdown cones from pumping wells are additive, where cones from multiple sources intercept, the total drawdown would be the sum of the EEC wells plus that of a given water right (e.g., an active irrigation well). Impacts associated with interfering drawdown cones include additional lift cost and/or loss of production capacity from the affected water wells. Maximum drawdown of 15.3 feet is predicted in the Lages Station Well Field at well EEC-5 with an initial depth to water at that location of 60 feet and less at the other wells. Drawdown greater than about 3 feet was localized to the general area of the well field and the area northeast of the well field. Seven individual water rights are located within the Lages Station Well Field drawdown contours that are greater than 5 feet. **Table 4.2-1** provides a comparison of the groundwater pumping water supply alternatives in relation to active water rights affected, while Maps 34-79 and Appendix D of EMS-I (2008) depict the locations of affected water rights and disclose the names of their holders. For the Proposed Action, a total of eight active water rights are present within drawdown contours, with the majority falling between 5 and 10 feet of predicted drawdown. These impacts on existing water rights would be long-term and minor to moderate, depending on the degree of reduced production within the affected water supply wells and considering the number of affected water rights when compared to the other water supply alternatives. The Lages Station Well Field Water Supply would affect more active water supply wells in Steptoe Valley than the Middle (1) or South (5) Well Fields, but fewer than the Reduced Lages Station with Coyote Valley Ranch (17) or the Reduced Lages Station with Limited South (18) Well Fields.

Water Supply Alternatives

As stated above, long-term operation of the plant site would require approximately 8,000 AFY of water. Four groundwater pumping scenarios, as well as one surface water diversion scenario, have been identified as alternatives to supply water to the South Plant Site. Impacts associated with each of these scenarios are discussed below.

TABLE 4.2-1. SUMMARY OF WATER RIGHTS AFFECTED BY THE PROPOSED ACTION AND ALTERNATIVES

WATER SUPPLY LOCATION	NUMBER OF ACTIVE WATER RIGHTS WITHIN DRAWDOWN CONTOURS (50-YEAR)									
	1-2 FT.	2-3 FT.	3-4 FT.	4-5 FT.	5-6 FT.	6-7 FT.	7-8 FT.	8-9 FT.	9-10 FT.	>10 FT.
Lages Station	1	1	0	0	2	3	1	0	0	0
Reduced Lages Station w/ Coyote Valley Ranch Well Field (Alt)	3	2	4	2	1	0	1	0	0	1
Reduced Lages Station w/ Limited South Well Field (Alt)	5	4	4	4	1	0	0	0	0	0
Middle Well Field (Alt)	1	0	0	0	0	0	0	0	0	0
South Well Field (Alt)	0	4	0	1	0	0	0	0	0	0

Source: EMS-I (2008)

Reduced Lages Station with Coyote Valley Ranch Well Field

This water supply alternative involves the pumping of 5,000 AFY of water from the Lages Station Well Field, in addition to 3,000 AFY from two well sites within the Coyote Valley Ranch Well Field located on private land in central Steptoe Valley, approximately 5 miles north of the South Plant Site (**Figure 2.2-2**). Water would be supplied to the plant site via underground pipeline, and the impacts associated with this pipeline would be the same as with the Proposed Action. A construction well would be developed on the plant site and converted to potable water for the life of the plant; however, drawdowns associated with this well would be less than 1 foot and thus would be a long-term and negligible impact (EMS-I 2008). Groundwater modeling indicated that maximum drawdown in the Lages Station area would be 10.2 feet at EEC-5 with an initial depth to water at that location of 60 feet, and the average maximum across all wells in the Lages Station area would be 6.3 feet. The area affected by drawdown greater than 1 foot was predicted to extend about 3 miles to the southwest and 3 miles to the northwest of the Lages Station Well Field (**Figure 4.2-2**). Drawdown of 2 to 3 feet extended east and northeast of the well field to the model boundary. Drawdown in the vicinity of the alluvial fan springs located west of Goshute Lake was predicted to be approximately 1 foot with an estimated starting depth to the water table of the valley-fill aquifer of 50 feet. The drawdown extended under fewer of the springs compared to the Proposed Action. The maximum drawdown at Coyote Valley Ranch was 48.3 feet at Coyote Valley Ranch Well 2 with an initial depth to water at that location of 16 feet, and the average maximum across the two wells at Coyote Valley Ranch was 29.4 ft. Drawdown greater than 1 foot extended from the Coyote Valley Ranch Well Field to about 7 miles to the north and over 10 miles to the south. An area of drawdown greater than about 5 feet extended slightly less than 2 miles to the north, east, and south of the Coyote Valley Ranch Well Field and about ½ mile west of the well field. Drawdown in the vicinity of the alluvial fan springs located in the Campbell Embayment was less than 1 foot with an approximate starting depth to water in the valley-fill aquifer of 100 feet. Ephemeral reaches of Big Indian Creek, Mattier Creek, and Fitzhugh Creek occur within the 1- to 4-foot drawdown contours north of the well field, while portions of the perennial reach of Duck Creek, Steptoe Slough, and Bassett Lake occur within the 1- to 2-foot drawdown contours south of the well field. McGill Spring, south of the South Plant Site and the Coyote Valley Ranch Well Field, occurs in the vicinity of the 4 ft. drawdown contour.

Drawdown contours do not extend west into Campbell Embayment or below Duck Creek east of Steptoe Ranch and Monte Neva Hot Springs.

As discussed above, impacts to alluvial fan springs, mountain streams, and Goshute Lake, as well as vegetation and sensitive species associated with them, would be unlikely due to the lack of hydraulic communication between these sources and the valley-fill aquifer from which the water supply would be pumped. Although the model domain does not extend into the mountain block east of the Coyote Valley Ranch Well Field, and therefore the model did not predict impacts in this area, it is unlikely that impacts in the Duck Creek Valley upgradient of Gallagher Gap would occur. The April 2007 water table map (EMS-I 2008) shows a depth to water of 250 feet in the eastern most portion of the alluvial fan. Streams and springs in the Duck Creek Valley are located at elevations 200 or more feet higher than the top of well casing elevation of the Coyote Valley Ranch wells. Because the water level in the alluvial fan located just west of Gallagher Gap is at least 400 feet below the stream and spring elevations east of Gallagher Gap, groundwater intercepted by the wells in the alluvial fan would not be expected to have direct hydraulic communication with springs or streams located in Duck Creek Valley.

The Steptoe Slough-Bassett Lake area is located in a portion of the valley floor that appears to be supported by surface water flow from Duck Creek, Tailings Creek, and McGill Spring, in addition to flow generated by seeps and springs (i.e., Heusser Spring) located in the south end of the slough at the base of the alluvial fan extending out from the western-bounding Egan Range (JBR 2008b). Extensive marsh wetlands occur within the Steptoe Slough-Bassett Lake area, fluctuating in size both seasonally and annually. Water levels in Bassett Lake are controlled via a batten board weir structure located at the eastern end of the Bassett Lake dam, which enables managers to raise and lower the storage capacity of the reservoir. During spring 2007, following above-average snowpack years in 2005 and 2006, and an above average precipitation year in 2005 (**Section 3.2.3.1**), substantial amounts of water were noted in Bassett Lake and Steptoe Slough; however, during spring 2008, following a below-average precipitation year in 2007 and a below-average water-year snowpack (to date), it was noted that a significant reduction in saturated wetland areas occurred in Steptoe Slough, and Bassett Lake levels had dropped and were being managed at their minimum elevation (JBR 2008b).

As discussed in **Section 4.2.1.2**, the groundwater model utilized for this project conservatively assumed a single, unconfined aquifer system occurs throughout Steptoe Valley, due to a lack of detailed hydrogeologic data in the area. Water levels in existing wells near the Steptoe Slough indicate depths to the water table under the slough to be 10 feet or more. Based on field observations reported in JBR (2008b), the Steptoe Slough-Bassett Lake area is supported by excess surface water entering the system, as opposed to being supported by the regional aquifer. Since these wetlands appear to be surface water-supported, they would be minimally affected by drawdowns associated with the Coyote Valley Ranch Well Field. The modeled drawdowns on valley-fill aquifer are approximately 2 feet in the vicinity of the Steptoe Slough and Bassett Lake. The lowering of the valley-fill water table beneath Steptoe Slough by 2 feet would have a negligible effect on overall wetlands in the slough area, since natural seasonal and annual fluctuations in surface water supply are more likely to be the controlling factor in wetland areal extent. Heusser Spring (and associated seepage areas in the same vicinity) occurs at the toe of the alluvial fan extending from the Egan Range and likely represents a condition similar to the spring clusters located west of Lages Station, as discussed above. Because its flow is not connected to the valley-fill aquifer, groundwater pumping in the region should have no affect on the spring.

Bassett Lake is a man-made reservoir largely supported by balancing surface inflows to the reservoir with discharge from the reservoir, which would tend to mitigate the effects of a 2-foot lowering of the local water table. Bassett Lake appears to be primarily a recharge system, where water present in the reservoir is lost not only to surface discharge but also to groundwater infiltration. Wetland areas at the margins of Bassett Lake appear to be supported by the fluctuating surface water levels, and would be negligibly impacted by a 2-foot lowering of the local valley-fill water table.

Approximately 4 feet of drawdown is predicted under this alternative in the vicinity of McGill Spring. McGill Spring discharges from an alluvial fan groundwater system that has similar conditions to the spring clusters located west of Lages Station, as discussed above, except the McGill Spring recharge source is likely bedrock groundwater underflow from the Schell Creek Range (Mayo 2007a). Although the modeled drawdowns extend to McGill Spring, the combined factors of the close proximity of the spring to the bedrock water source, the relative steepness of the alluvial fan, and the depth to the valley fill aquifer water table make it unlikely that direct hydraulic communication exists between the shallow alluvial fan groundwater system that supports the spring and the groundwater system that would supply the Coyote Valley Ranch

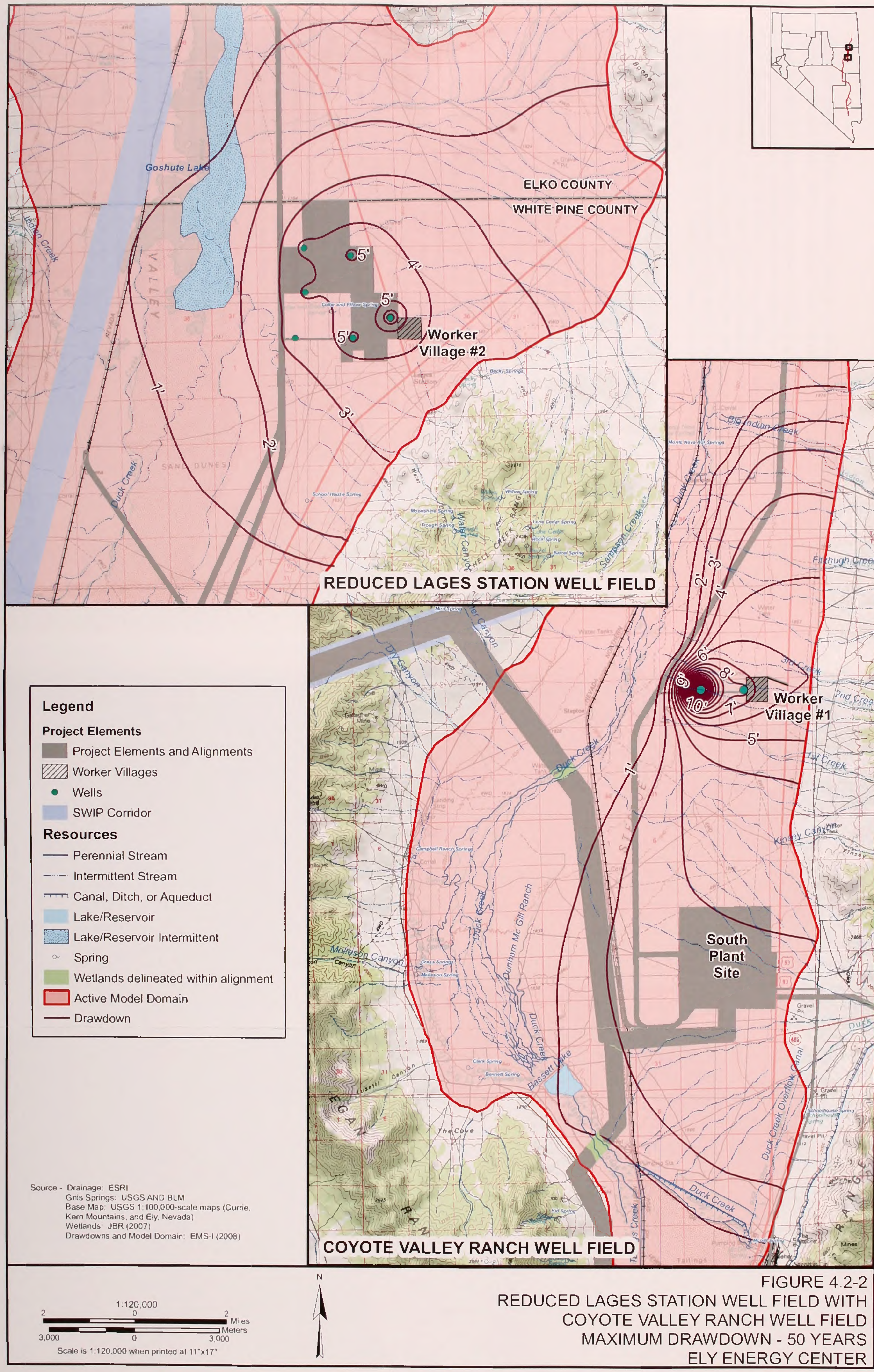

FIGURE 4.2-2
REDUCED LAGES STATION WELL FIELD WITH
COYOTE VALLEY RANCH WELL FIELD
MAXIMUM DRAWDOWN - 50 YEARS
ELY ENERGY CENTER

Well Field (Mayo 2007b). Therefore, impacts to McGill Spring as a result of groundwater pumping at Coyote Valley Ranch would not be anticipated.

Potentially affected water rights are shown in **Table 4.2-1**. A total of 17 active water rights would be affected by predicted drawdowns for this alternative, with the majority falling between 2 and 5 feet. This would be a long-term and minor to moderate impact, depending on the degree of reduced production in the affected water supply wells and when considering the number of affected water rights. The Reduced Lages Station with Coyote Valley Ranch Well Field Water Supply would affect more active water supply wells in Steptoe Valley than the Lages Station (8), Middle (1), or South (5) Well Fields, but fewer than the Reduced Lages Station with Limited South Well Field (18).

<u>*Reduced Lages Station with Limited South Well Field*</u>

This water supply alternative involves the pumping of 5,000 AFY of water from the Lages Station Well Field, in addition to 3,000 AFY from three well sites located along the proposed pipeline ROW west-northwest of the South Plant Site (**Figure 2.2-2**). Water would be supplied to the plant site via underground pipeline, and the impacts associated with this pipeline would be the same as with the Proposed Action. A construction well would be developed on the plant site and converted to potable water for the life of the plant; however, drawdowns associated with this well would be less than 1 foot and would be a long-term and negligible impact. Drawdown contours and impacts from the Lages Station pumping would be identical to that of the alternative utilizing the Coyote Valley Ranch Well Field. Drawdown contours from the Limited South Well Field pumping extend to a lesser degree north and a greater degree south compared to the Coyote Valley Ranch Well Field contours. Modeled drawdown greater than 1 foot extended about 9 miles to the north and about 5 miles south of the Limited South Well Field (**Figure 4.2-3**). Drawdown extended from the well field east to the model boundary and west about 2.5 miles. Drawdown under Bassett Lake was about 2 feet and 1 foot of drawdown extended about 1 mile downstream of the lake under Duck Creek. Maximum drawdown in the Limited South Well Field area was 21.4 feet at South Well 2, with an average maximum drawdown across all wells of 15.2 feet. The starting depth to water at South Well 2 is 56 feet. Drawdown in the vicinity of the alluvial fan springs located in Campbell Embayment was 1 foot or less with an approximate starting depth to groundwater in the valley-fill aquifer of 100 ft. Drawdown in the vicinity of the South Plant Site construction well (i.e., 200 feet from the well) was 4.5 feet after 50 years of pumping. Ephemeral reaches of Big Indian Creek and Fitzhugh Creek occur within the 1 to 3 foot drawdown contours north of the well field, while portions of the perennial reach of Duck Creek, Steptoe Slough, and Bassett Lake occur within the 1 to 4 foot drawdown contours south of the well field. McGill Spring occurs in the vicinity of the 3-foot drawdown contour.

Effects on Steptoe Slough, Bassett Lake, portions of the perennial reach of Duck Creek, and McGill Spring would be similar to those described above for the Reduced Lages Station with Coyote Valley Ranch Well Field. Because the Limited South Well Field is located approximately 4 miles south of the Coyote Valley Ranch Well Field, drawdown contours in the vicinity of each of these features are 1 to 3 feet greater. Because these features are primarily supported by surface water flow, drawdown effects to Steptoe Slough and Bassett Lake would be negligible.

Impacts to flow in Duck Creek and McGill Spring would still be unlikely. Impacts to flow within the Campbell Embayment springs would be unlikely for the same reason as discussed in regards to those springs located west of Lages Station and Goshute Lake – these springs

discharge 30 to 50 feet above the valley floor and thus are not supplied by the valley-fill aquifer (Mayo 2007b).

A total of 18 active water rights would be affected by predicted drawdowns, with the majority falling between 1 and 4 feet. This would be a long-term and minor to moderate impact, depending on the degree of reduced production within the affected water supply wells and when considering the number of affected water rights when compared to the other water supply alternatives. The Reduced Lages Station with Limited South Well Field would affect the most active water supply wells of any South Plant Site water supply alternative.

Middle Well Field

This water supply alternative involves the pumping of 8,000 AFY of water from eight wells located on BLM land north of the South Plant Site (**Figure 2.2-2**). Water would be supplied to the South Plant Site via underground pipeline, and the types of water resource impacts associated with this pipeline would be the same as with the Proposed Action. A construction well would be developed on the plant site and would be converted to potable water for the life of the plant; however, long-term drawdowns associated with this well would be less than 1 foot and would be negligible. The maximum area with modeled drawdown greater than 1 foot extended about 2 miles south of the well field and about 3.5 miles north (**Figure 4.2-4**). This drawdown effect extended east to the model boundary and about 2 miles west of the well field. An area with more than 5 feet of drawdown was limited to the immediate area of the southernmost well, Middle Well Field Well 8. Maximum drawdown in the Middle Well Field was 13.2 feet at Middle Well Field Well 8, with an initial depth to water at that location of 119 feet. Average maximum drawdown across all wells in the Middle Well Field was 5.0 feet.

No springs are located within the predicted drawdowns, and drawdowns of 1 foot or less are predicted beneath Duck Creek. According to the April 2007 water table map (EMS-I 2008), the depth to alluvial-fill groundwater beneath Duck Creek is 50 feet or less, while digital files associated with the groundwater model indicate it is typically 10 feet or less. This reach of Duck Creek is only seasonally inundated and is a losing reach. The small predicted drawdowns associated with this water supply alternative would not result in reduced flow or impacts in Duck Creek, as the water table is not at or near the land surface and thus there is no hydraulic communication between the Duck Creek surface water and the unconfined aquifer (Mayo 2007b).

One active water right occurs in predicted drawdown zones, near the center of the well field in a drawdown area of 1 to 2 feet. Impacts to this well would be long-term and minor, and they would occur in the form of reduced production in the affected well. The Middle Well Field would affect the fewest water supply wells of any South Plant Site water supply alternative.

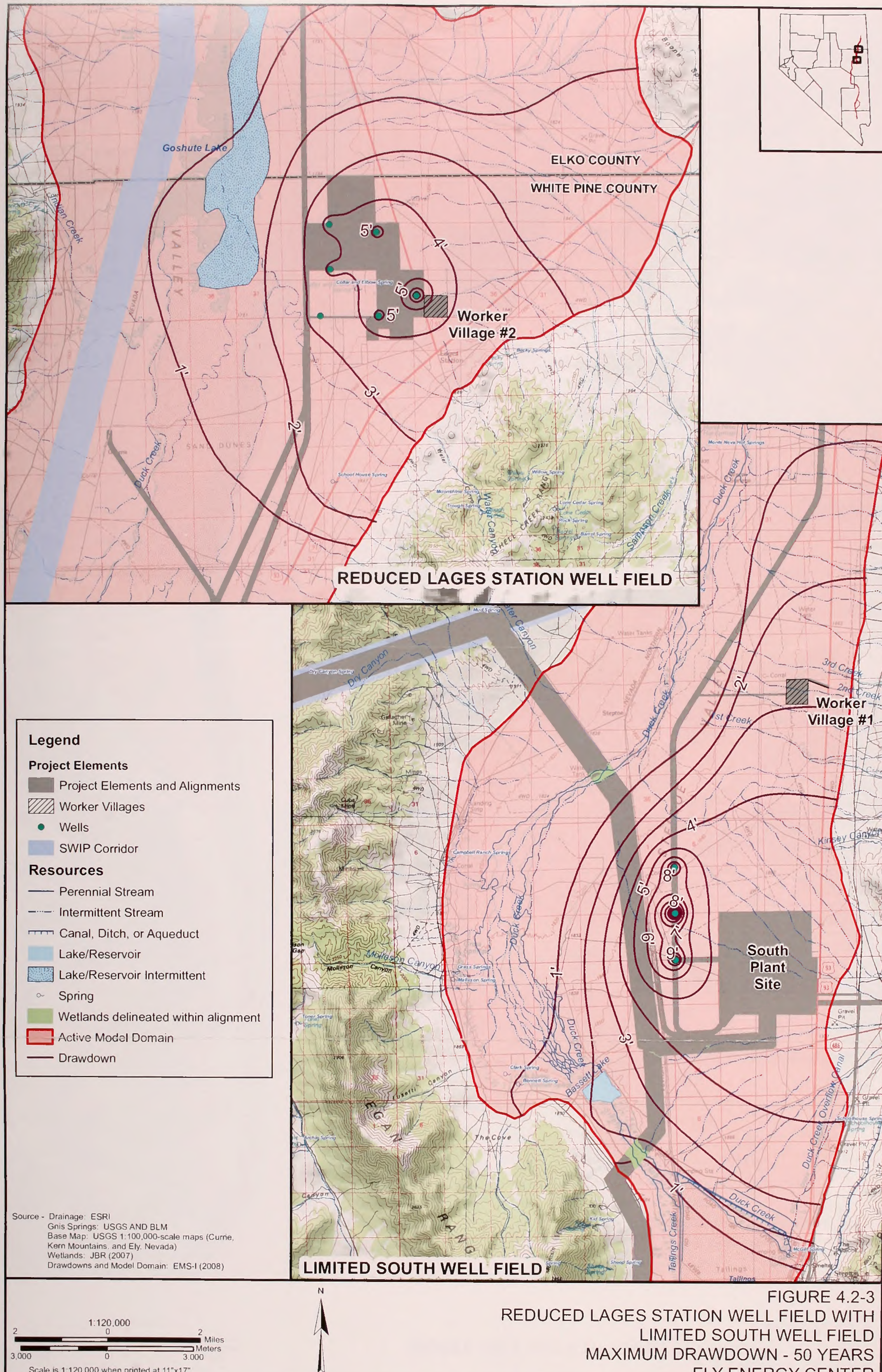

FIGURE 4.2-3
REDUCED LAGES STATION WELL FIELD WITH
LIMITED SOUTH WELL FIELD
MAXIMUM DRAWDOWN - 50 YEARS
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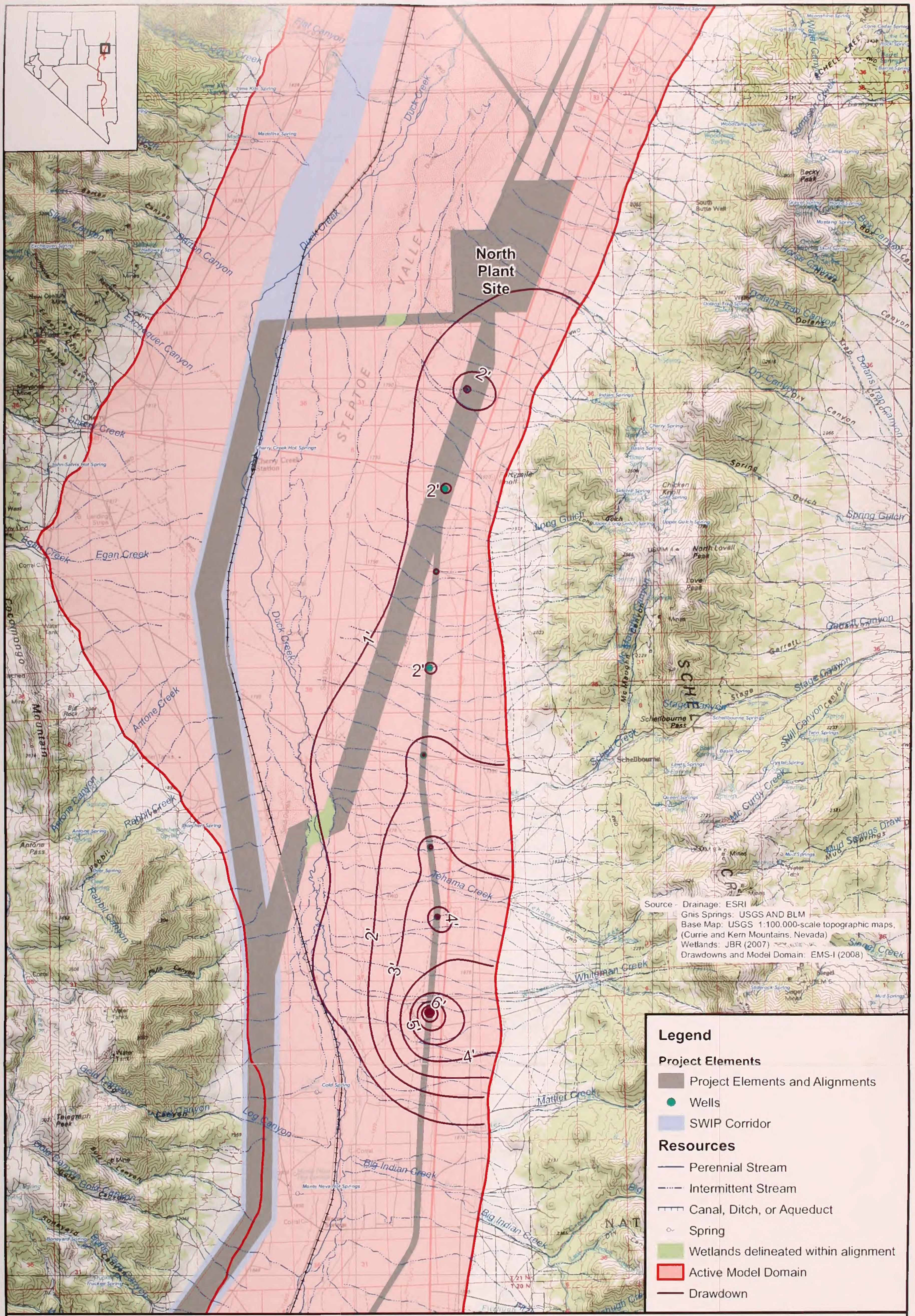

FIGURE 4.2-4
MIDDLE WELL FIELD MAXIMUM DRAWDOWN - 50 YEARS
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South Well Field

This water supply alternative involves the pumping of 8,000 AFY of water from eight wells located on BLM land west and northwest of the South Plant Site (**Figure 2.2-2**). Water would be supplied to the South Plant Site via underground pipeline, and the types of water resource impacts associated with this pipeline would be the same as with the Proposed Action.

A construction well would be developed on the plant site and converted to potable water for the life of the plant; however, drawdowns associated with this well would be less than 1 foot and impacts would be long-term and negligible. The maximum area with modeled drawdown greater than 1 foot extended about 0.5 miles north of the well field and about 3 miles south (**Figure 4.2-5**). This drawdown effect extended east to the model boundary and about 3 miles west of the well field. An area with more than 15 feet of drawdown was limited to the immediate area of the wells 7 and 8 in the well field, with an average drawdown in the immediate vicinity of wells 1 through 6 of about 10 feet. Drawdown under Bassett Lake was about 2.5 feet and 1 foot of drawdown extended about 1 mile downstream of Bassett Lake under Duck Creek. Maximum drawdown in the South Well Field was 62.6 feet at South Well Field Well 8, with an initial depth to water at that location of 4 feet. Average maximum drawdown across all wells in the well field was 17.5 feet. Drawdown in the vicinity of the alluvial fan springs located in Campbell Embayment was less than 1 foot with an approximate starting depth to valley-fill groundwater of 100 feet (EMS-I 2008).

Effects on Steptoe Slough, Bassett Lake, Duck Creek, McGill Spring, and Campbell Embayment would be similar to those as described for the Coyote Valley Ranch Well Field. The amount of drawdown under Bassett Lake and Duck Creek downstream of the lake would be slightly greater than for the Coyote Valley Ranch Well Field and the impacts from the drawdown on surface resources would be negligible. The northernmost well is located less than 1 mile east of a perennial reach of Duck Creek and has a maximum predicted drawdown of 62.6 feet. However, modeled depression cones are tightly restricted to the area immediately surrounding this well, and less than 2 feet of drawdown is predicted near Duck Creek. Impacts to the flow of Duck Creek are unlikely for the reasons discussed in the Middle Well Field Alternative above.

Five active water rights occur in predicted drawdown zones, with one occurring in an area of greater than 4 feet of drawdown. These impacts would be long-term and minor to moderate, depending on the degree of reduced production within the affected water supply wells and when considering the number of affected water rights when compared to the other water supply alternatives. The South Well Field would affect more active water supply wells in Steptoe Valley than the Middle Well Field (1), but fewer than the Lages Station (8), Reduced Lages Station with Coyote Valley Ranch (17), or the Reduced Lages Station with Limited South (18) Well Fields.

Duck Creek Impoundment

The Duck Creek Impoundment water supply alternative involves the diversion of 8,000 AFY of surface water rights currently owned by KCC to the South Plant Site. Water is currently stored in an impoundment facility located in the Duck Creek Valley approximately 2 miles south of Gallagher Gap (**Figure 2.2-2**). A new pipeline would be constructed, extending from the impoundment to the South Plant Site. Within Duck Creek Valley, the pipeline would be constructed immediately adjacent to or underneath the existing county road to avoid impacts to wetlands. Upon reaching Gallagher Gap, the pipeline would diverge from the road and continue west, underneath US-93, and to the South Plant Site. Temporary impacts to North Creek in Duck Creek Valley, such as erosion and sedimentation and/or changes in flow path and hydroperiod would be possible during construction, although the pipeline corridor would utilize

an existing bridge over the creek. BMPs would be employed to avoid and minimize surface water impacts to the creek. These impacts would be short-term and minor. No other surface water resources would be affected by the construction of the pipeline.

As discussed in **Section 3.2.3.2**, water from the impoundment is currently utilized in irrigation of the KCC's reclaimed tailings ponds, primarily from May to September. During the period of October to April, water is discharged back into the Duck Creek system via the KCC aqueduct at a point approximately 2 miles south-southeast of Bassett Lake near the middle of Steptoe Slough. During the irrigation period, water returns to the Duck Creek system via infiltration and/or runoff, while a portion is lost to ET. Small gaining flows from North Creek, East Creek, and Tailings Creek contribute to the Duck Creek system, as does input from McGill Spring, and Heusser Spring. Measured Duck Creek flows from various locations throughout the system are shown in **Table 3.2-2**.

There would be no difference in the amount of water diverted out of the KCC Duck Creek Reservoir under this alternative compared to the current water usage by KCC. Impacts to the surface water regime in Duck Creek Valley due to collection and diversion of water from the reservoir would be the same under this alternative as the current condition. The primary difference between the current utilization of the surface water rights for irrigation vs. the water supply for the power plant is the location and annual amount of the consumptive use of the water taken from the reservoir. The 8,000 AFY (about 11.05 cfs) proposed for use in the power plant currently re-enters the Duck Creek system, either in part for five months out of the year (excess water not used during irrigation season) or in whole for seven months out of the year when the flow is not used for irrigation. During the irrigation period, water re-enters the system via surface runoff into Tailings Creek (on the west side of the KCC tailings area) or through the pipeline discharge location at a pumphouse located near the northwest corner of the tailings area, as well as via recharge to the shallow aquifer. During the period where irrigation is not conducted, the full amount of water proposed for use in the power plant re-enters the Duck Creek system via this pipeline discharge location. Flow through the Duck Creek Valley impoundment (and bypass channel) ranges from approximately 12 cfs during low-flow periods to over 23 cfs during spring runoff. According to flow monitoring data provided by KCC, average annual flow through the pipeline between 1998 and 2006 was approximately 9,500 AFY, or approximately 13 cfs. KCC currently irrigates approximately 3,600 acres of land for five months (May to September) at an annual rate of approximately 4,000 ac-ft., while the balance of the water from the pipeline, approximately 5,500 AFY, is released to the Duck Creek system downstream of the KCC property either as surface flow or recharge to the shallow aquifer during the remaining seven months (October to April). It is assumed that if the required volume necessary for plant operation (8,000 AFY) was used for that purpose, KCC would utilize the remaining 1,500 AFY for seasonal irrigation. This would represent a 63 percent reduction in water applied as irrigation (and subsequent loss to the Duck Creek system due to runoff and/or shallow groundwater infiltration) during the summer months and a 100 percent reduction in water discharged directly to the Duck Creek system during the winter months. The amount of water released from the pipeline to the Duck Creek system during the non-irrigation period would decrease from the current 5,500 AFY to 0 AFY. This would be a long-term major impact.

It is difficult to accurately predict the extent of surface water impacts in Duck Creek associated with the use of water from the KCC water source for the EEC compared to current conditions, because long-term flow measurements are only available at the Duck Creek impoundment and McGill headgate of the KCC system and not for Duck Creek downstream of these features.

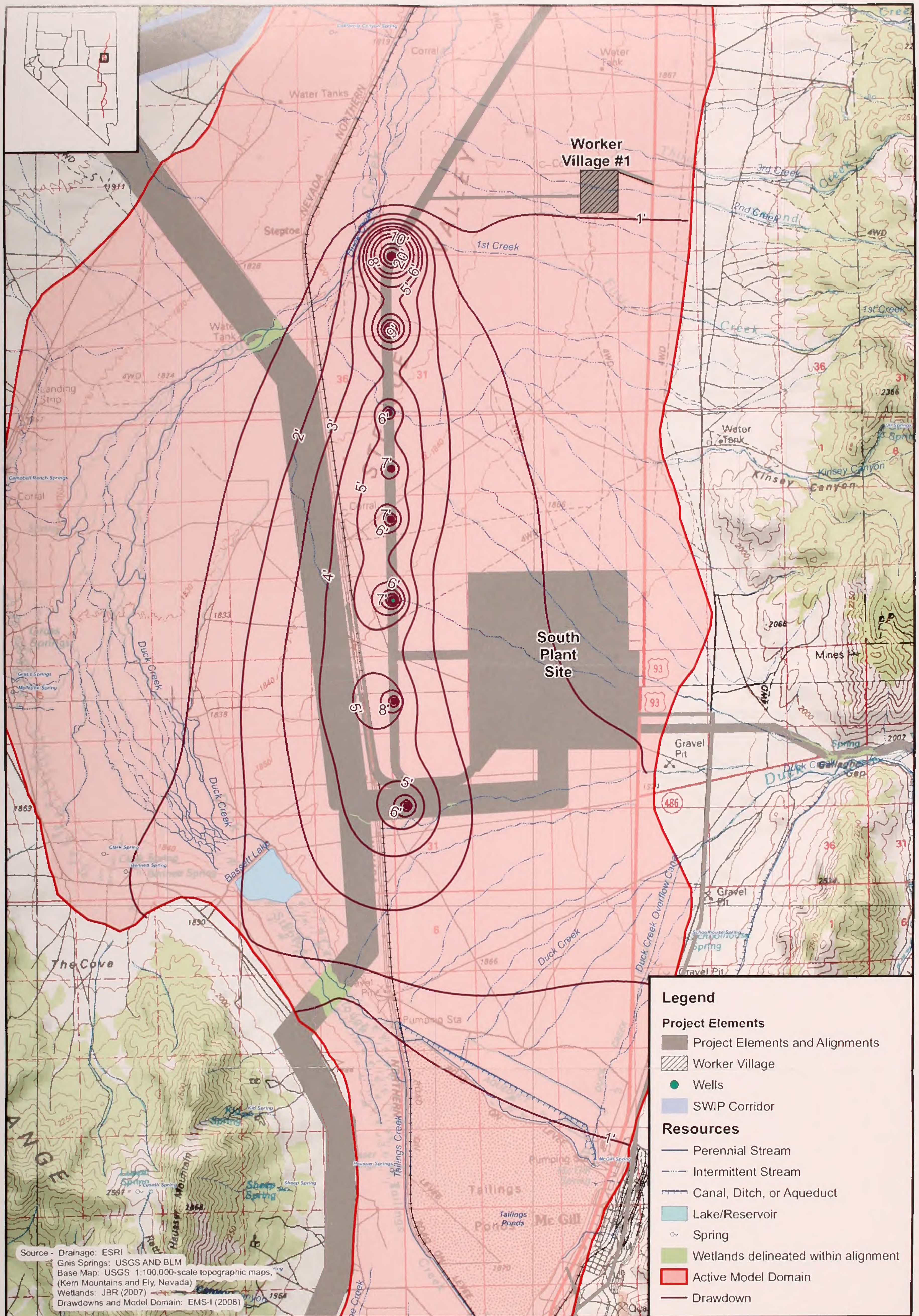

FIGURE 4.2-5
SOUTH WELL FIELD MAXIMUM DRAWDOWN - 50 YEARS
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Measured flows in Duck Creek below Bassett Lake in July 2007 were nearly 19 cfs, and maximum flows at this same location in early May 2007 were nearly 50 cfs. If 11 cfs were taken out of this system for the EEC, flow out of Bassett Lake during 2007 would have been reduced to about 9 cfs in the summer and about 39 cfs in the spring. The water balance for Bassett Lake would not likely be affected by the proposed diversion of water, but the flows in Duck Creek below the lake would be reduced. During 2007, the summer flow out of Bassett Lake would have been reduced by approximately 58 percent and the spring flow by about 22 percent. However, as noted in JBR (2008b), flow measurements and observations taken during this period may have over-estimated normal surface water conditions, due to above-average precipitation during the previous two water years. The most likely observable impacts from this loss of water input would be in Steptoe Slough, where the KCC aqueduct and/or Talings Creek (depending on the time of year) currently discharges, as well as the distal end of the Duck Creek surface water flow. Since Steptoe Slough appears to be supported by existing surface water flows (JBR 2008b), it is reasonable to assume that a reduction in surface water recharge could result in a reduction in wetland area, causing secondary effects on vegetative communities and wildlife. These indirect effects may include a shift from mesic and hydrophytic herbaceous cover to a more xeric valley grassland, in turn increasing the potential for fugitive dust. Wildlife that readily utilize the wetland area for foraging and habitat, including birds, fish, and amphibians, as well as such special status species as wood nymphs and relict dace, would have reduced habitat availability. In addition to a change in the vegetative cover at Steptoe Slough, there is also the potential for a change in cover at the McGill tailings area as a result of the reduced irrigation amounts. The impacts to flows in Duck Creek and wetland areas associated with Steptoe Slough would be long-term and major.

Gaining flows in Duck Creek occur downstream of Bassett Lake due to significant inflow from springs located in the Campbell Embayment. Measured flows of Duck Creek downstream of this input indicate that as much as 13 cfs is contributed during spring runoff (although summer measurements indicate a significant portion is similarly diverted during irrigation season), bringing high-flow totals to over 62 cfs. During late Spring 2007 high-flow periods, water was observed as far north as Cherry Creek Highway and beyond, while in late Fall 2006 low-periods, the crossing at the Pony Express Road was dry. It is likely that the removal of 8,000 AFY of water could change the location of the distal ends of flow of Duck Creek; however, the exact location would vary significantly with the precipitation and snow pack in a given year. Considering flow measurements were conducted during a period of above-average precipitation and runoff (JBR 2008b), impacts in this reach of Duck Creek would be long-term and moderate to major.

4.2.2.4 Direct and Indirect Effects on Water Resources from Rail Facilities

Construction

Surface Water Resources

New construction of a rail lead would occur from the NNRy to the South Plant Site. The new construction of the rail lead from the NNRy to the South Plant Site would not directly or indirectly affect any surface water resources, including wetlands. Sanitary wastewater produced along the rail line construction project would be managed with portable facilities and sanitary waste would be trucked to a POTW for disposal. BMPs would be implemented to avoid and/or minimize surface water quality impacts during the construction phase.

As an alternative to using the NNRy to transport coal and other supplies to the EEC, an Alternative Rail Line would be constructed from Shafter, Nevada to either the North or South Plant Site. During the construction phase, a number of east-west coursing, dry, ephemeral

washes located in Goshute and Steptoe Valleys would be disturbed during construction of the rail line. Impacts to these washes may include rerouting of channels along the roadbed and/or rail grade with ditches; installation of cuts and fills along the ROW with increased slopes as compared to natural conditions, thus increasing erosion potential and sediment transport rates; reduction of in-channel peak flows at and downstream of culverts; increased sediment transport as a result of permanently disturbed surfaces such as access roads; and the potential for spills of fuel and lubricants from construction equipment. Appropriately sized and located culverts would be placed along the rail line corridor to maintain hydrology and sediment transport, prevent localized flooding, and allow for the continuance of natural flowpaths both up- and downstream of the rail line. BMPs would be implemented along the rail line construction corridor to avoid and/or minimize surface water quality impacts during the construction phase, particularly associated with runoff related to rail line ballast. Impacts to surface water resources during construction would be short-term and minor while BMPs are established and ground conditions are allowed to stabilize.

Wetlands and/or special flood hazard areas are not present along the Alternative Rail Line corridor.

Groundwater Resources

The new construction of the rail lead would require construction water for dust control and earth compaction. This water would be purchased from existing water right users and trucked to the place of use. Impacts to groundwater resources from this practice would be temporary and negligible to minor.

Water for construction of the Alternative Rail Line would also be acquired from existing water rights in the area and trucked to the construction site for use in compaction and dust control. This water withdrawal would impact groundwater levels locally at the well locations, but not more than allowed by the existing water right. This impact would be short-term and negligible.

The construction of the Alternative Rail Line would not affect groundwater quality.

Operations, Maintenance, and Abandonment

Surface Water Resources

Maintenance of the NNRy ROW may require periodic wetland and surface water impacts, including culvert replacement, maintenance of rail embankments, and maintenance road crossing access. These impacts would be covered under Nationwide Permit No. 3 – Maintenance (assuming the impact activities were previously permitted at the onset of construction), and they would be minimized or avoided through the use of BMPs. There are no surface water resources that would be affected by the operation and/or maintenance of the rail lead.

Operations and maintenance under the Alternative Rail Line would be unlikely to affect surface water resources. Culverts to address hydrology concerns would be installed during construction, and periodic maintenance/monitoring would be conducted to insure that they are properly functioning and appropriately located. A permanent maintenance road adjacent to the rail line would be constructed at grade to prevent interruption of east-west flowpaths. Since wetlands and/or special flood hazard areas are not present along the Alternative Rail Line, operation and maintenance impacts to surface water resources would be negligible. These impacts would be long-term and minor.

Groundwater Resources

Operations, maintenance, and abandonment of the rail lead or the Alternative Rail Line would not affect groundwater resources.

4.2.2.5 Mitigation

Additional mitigation measures are not required.

4.2.2.6 Unavoidable Adverse Impacts on Water Resources

Unavoidable adverse impacts on water resources would be unlikely to occur as a result of surface disturbance associated with the Proposed Action, although 0.2 acres of permanent wetland impacts are predicted under electric transmission facilities Alternative Segment 3. Any additional wetland impacts would be mainly limited to maintenance of the NNRy and would be minimal, and the implementation of BMPs would minimize potential water quality degradation and localized flooding associated with other project elements. Although there are special flood hazard areas associated with the proposed electric transmission facilities that may be unavoidable, these impacts are not anticipated to be adverse, since the footprint of transmission line pole structures is negligible when compared to the total area of the special flood hazard zone that would be impacted.

Extensive groundwater modeling of the Proposed Action has been conducted by EMS-I (2008) and evaluated by Mayo (2007a; 2007b), and impacts to springs, streams, and other surface water features as a result of groundwater pumping for the Proposed Action are not predicted. The most likely potential for impacts from water supply alternatives would be in the area of active water rights. Water rights are present within each of the groundwater supply affected areas. Reduced productivity and/or additional lift cost are possible for those active water rights located within drawdown cones produced as a result of the Proposed Action and the groundwater supply alternatives. Unavoidable adverse impacts to Steptoe Slough and Basset Lake as a result of groundwater pumping are unlikely to occur. Unavoidable adverse impacts may also occur as a result of the Duck Creek Impoundment surface water diversion, particularly in the vicinity of Steptoe Slough and in the distal ends of the flow of the Duck Creek system.

4.2.2.7 Irreversible and Irretrievable Commitments of Resources

The Proposed Action groundwater pumping scenario would involve the production of 8,000 AFY from a deep aquifer system in the Lages Station vicinity. The addition of 8,000 AFY of consumptive use represents a 38 percent annual increase over existing consumptive use in northern Steptoe Valley. This would represent an irretrievable commitment of groundwater resources for the duration of the project (50 years). Following closure of the operations the consumptive use of the water dedicated to the project would be available for other uses or be terminated.

4.2.2.8 Relationship of Short-term Uses and Long-term Productivity

A minor amount of water resources would be affected during the short-term scope of project construction. Surface water features, such as wetlands or ephemeral washes, would be temporarily disturbed during plant site, associated worker village, pipeline, and rail lead construction or alternatives, while groundwater pumping to supply water to the plant construction site would result in less than 1 foot of drawdown in the immediate vicinity of the plant site well location (**Section 4.2.2.3**). In the long-term horizon of the project, surface water features would be affected during maintenance activities and impacts would be negligible. Groundwater resources would be utilized to a more significant degree; however, impacts associated with the water supply would similarly be negligible.

4.2.3 North Plant Site Alternative

The North Plant Site is located adjacent to US-93, between the Cherry Creek Highway and Lages Station, within Steptoe Valley basin. Transmission lines extending from the site would cross Duck Creek either to the west or southwest, as well as the White River in Nye County. The primary water supply scenario for the North Plant Site is groundwater pumping from Lages Station. Like the Proposed Action, several water supply alternatives have been developed for the North Plant Site. The well field alternatives include groundwater pumping from private water rights located at various locations throughout Steptoe Valley and delivered via underground pipeline from the well fields to the respective plant sites. Annual water supply requirements and pumping regimes would be the same under both the Proposed Action and the North Plant Site Alternative, with the only variation being the length of pipeline required to deliver water to the respective plant site location. The rail line alternatives include an Alternative Rail Line from Shafter, Nevada to the respective plant site location, as well as a rail lead from the NNRy to the North Plant Site.

4.2.3.1 Direct and Indirect Effects on Water Resources from Plant Site Construction

Surface Water Resources

The North Plant Site, like the South Plant Site discussed in **Section 4.2.2.1**, would be designed as a zero-discharge facility, and surface water effects would be the same as for the Proposed Action. During the construction phase of the project, reaches of nine unnamed, ephemeral washes totaling approximately 6 miles in length and located on the eastern half of the plant site would be relocated to the edge of the plant site boundary. The reaches currently discharge on the broad alluvial fan in the center of the North Plant Site location. The sections of the washes within the plant site would be permanently disturbed; however, flow rates, sediment transport, and water quality would be retained within the relocated channels downstream of the plant site. Direct effects to surface hydrology downstream of the plant site due to construction within the plant site would be anticipated to be long-term and minor. No indirect effects are anticipated.

Construction of the associated worker village is not anticipated to impact any surface water resources. Approximately 0.7 miles of an unnamed wash courses east-west through the center of the site. The worker village would be designed to avoid impacts to this feature to the extent possible, and appropriately sized culverts would be included at crossing locations to prevent surface hydrology impacts. Impacts to surface water resources from construction of the worker village would be temporary and minor.

BMPs would be implemented at both locations to avoid and/or minimize surface water quality impacts during the construction phase. Short-term, minor indirect effects may include the degradation of seasonal aquatic habitat for wildlife through altered hydrology, vegetation removal, or soil compaction.

Groundwater Resources

Groundwater quality would not be directly or indirectly affected by the construction of the North Plant Site or associated worker village. Effects to groundwater availability associated with water supply to the plant site are discussed in detail below.

Operations, Maintenance, and Abandonment

Surface Water Resources

As with the Proposed Action and described above, the North Plant Site would be designed as a zero-discharge facility. The same treatment, discharge, and monitoring activities would occur at the North Plant Site as at the South Site. Although long-term, direct effects to surface hydrology would be anticipated to be minor. Wetlands and designated floodplain areas are not present within the North Plant Site boundary. Impacts to surface water resources from operation of the plant would be long-term and minor.

The associated worker village is a temporary feature to be utilized only during the construction phase, and would therefore not have any long-term operation or maintenance impacts on water resources. Upon abandonment of the worker village, the site would be restored to pre-project conditions.

Groundwater Resources

The operation, maintenance, and abandonment of the North Plant Site and associated worker village would not directly or indirectly affect groundwater quality. Impacts to groundwater availability associated with water supply to the plant site are discussed in detail below.

4.2.3.2 Direct and Indirect Effects on Water Resources from Electric Transmission Facilities

Construction

Surface Water Resources

Electric transmission lines extend from the North Plant Site either southwest (Alternative Segment 1A) or west (Segment 1B) across Duck Creek, then south through the Robinson Summit Substation, across Ellison Creek in White Pine County and the White River in Nye County (Segment 6C), and continue on to the Harry Allen Substation expansion in Clark County (**Figure 2.2-2**). Waters of the United States, including wetlands, are present at these crossing locations (**Figure 3.2-1**).

Segment 1B, would exit the North Plant Site on the west side and would course west across Steptoe Valley, crossing Duck Creek west of the plant site, and then would continue south to the intersection with Segment 1C. The Segment 1B, EEC-RS #1 Line wetland crossing of Duck Creek is approximately 2,100 linear feet, while the EEC-RS #2 Line crossing is 2,000 linear feet. In both cases, construction impacts to wetlands and/or waters of the United States at this location would occur due to installation of transmission line structures. One structure and one stringing site would be required within the delineated wetland boundary per line. Total temporary impacts would be 9.4 acres, and total permanent impacts would be 0.2 acre Temporarily-impacted areas would be restored to pre-existing conditions upon completion of construction. A CWA Section 404 Individual Permit would be required from the Corps for these impacts. These impacts would be long-term and minor, due to the degree of impact to wetland resources relative to those available in the area.

Alternative Segment 1A would exit the plant site on the south side and would course southwest across Steptoe Valley, crossing Duck Creek near the intersection with Segment 1C. The Alternative Segment 1A, EEC-RS #1 Line wetland crossing of Duck Creek is approximately 3,800 linear feet, while the EEC-RS #2 Line crossing is 2,700 linear feet. In both cases, construction impacts to wetlands and/or waters of the United States at this location would occur due to installation of transmission line structures. One to two structures would be required within the delineated wetland boundary per line. Each structure would have a temporary disturbance of

1.5 acre and a permanent disturbance of 0.1 acre. Additionally, one or two stringing sites per line would be located within the wetland area, with a temporary impact of 3.2 acres per site. Total temporary impacts could be as much as 18.8 acre, and total permanent impacts could be as much as 0.4 acre if two structures per line were required within the wetland area. If one structure per line were required, then total temporary impacts would be 9.4 acres and total permanent impacts would be 0.2 acre Temporarily-impacted areas would be restored to pre-existing conditions upon completion of construction. A CWA Section 404 Individual Permit would be required from the Corps for these impacts. These impacts would be long-term and minor.

Waters of the United States impacts, including wetlands, associated with Segment 6C would be the same as the Proposed Action.

Access to electric transmission facilities for construction would be along existing roads and two-tracks. Should these existing roads require improvement resulting in wetland impacts, a Section 404 permit would be required from the Corps prior to construction. In the event transmission line stringing locations would cause impacts to wetland areas during construction, this would also require a permit. Given the impacts from either Segment 1B or Alternative Segment 1A, in addition to any potential access road impacts, a CWA Section 404 Individual Permit would be required. BMPs would be implemented within all segments to avoid and/or minimize surface water quality impacts during the construction phase. These impacts would be short-term and minor.

Special flood hazard areas are present within portions of Segment 6C in Nye County, and in Segment 11 in Clark County. Impacts to these areas would be the same as the Proposed Action.

No other surface water resources are present within the alternative electric transmission elements.

Groundwater Resources

The construction of the electric transmission facilities would not affect groundwater resources.

Operations, Maintenance, and Abandonment

Surface Water Resources

In the event that a maintenance access road to a transmission line was deemed necessary in a wetland area during the service life of the project, this activity could be permitted under either Nationwide Permit No. 12 – Utility Line Activities or under Nationwide Permit No. 03 – Maintenance, if the impacts would be less than 0.5 acre These impacts would be short-term and negligible to minor.

Groundwater Resources

The operation, maintenance, and abandonment of the alternative electric transmission facilities would not affect groundwater resources.

4.2.3.3 Direct and Indirect Effects on Water Resources from Water Supply Facilities

Construction

Surface Water Resources

Construction impacts for the Lages Station Well Field and pipeline would be the same as for the Proposed Action, except the water supply pipeline would extend from Lages Station and terminate at the North Plant Site location (**Figure 2.3-1**).

Groundwater Resources

In addition to the water supply pipeline, one well would be developed within the plant site boundary for construction water. This well would be pumped at an average annual rate of 174 GPM (282 AFY) during the four-year construction period and then at about 6.2 GPM (10 AFY) thereafter for domestic water supply use for the plant. According to groundwater modeling conducted by EMS-I (2008), less than 1 foot of drawdown would occur as a result of this well development. Direct effects associated with this well during construction would be negligible.

Operations, Maintenance, and Abandonment

Surface Water Resources

Impacts associated with operations, maintenance and abandonment would be the same as for the Proposed Action, except the pipeline would only extend from Lages Station to the North Plant Site.

Groundwater Resources

As indicated above, the construction well on the North Plant Site would be converted to potable use upon completion of plant construction. According to groundwater impact modeling conducted by EMS-I (2008), less than 1 ft. of drawdown would occur after 50 years of pumping from this location. Drawdown effects from this well on groundwater resources would be long-term and negligible.

Operational water supply impacts are discussed in detail below.

Lages Station

Water supply impacts associated with the North Plant Site would result from the long-term operation of the plant site, requiring approximately 8,000 AFY of water to be supplied via groundwater pumping from six wells located on private land in the vicinity of Lages Station. Impacts associated with the Lages Station water supply scenario would be identical to those described in the Proposed Action under **Section 4.2.2.3**.

Water Supply Alternatives

As stated above, long-term operation of the North Plant Site facility would require approximately 8,000 AFY of water. Four groundwater pumping scenarios have been identified as alternatives to the primary water supply scenario located at Lages Station. Impacts associated with each of these scenarios are discussed below.

Reduced Lages Station with Coyote Valley Ranch Well Field

Impacts associated with this water supply alternative would be identical to those described in the Proposed Action under **Section 4.2.2.3**.

North Well Field

This water supply alternative involves the pumping of 8,000 AFY of water from five wells located on BLM land north of the North Plant Site and south of Lages Station. It is an alternative element for only the North Plant Site (**Figure 2.3-1**). Water would be supplied to the plant site via underground pipeline, and the types of water resource impacts associated with this pipeline would be the same as with the Proposed Action. A construction well would be developed on the plant site and converted to potable water for the life of the plant; however, drawdowns associated with this well would be less than 1 foot and would be a long-term, negligible impact. For the North Well Field, the maximum area with modeled drawdown greater than 1-foot extended about 3 miles south of the well field and about 5 miles north (**Figure 4.2-6**). An area

with more than 6 feet of drawdown was limited to the immediate area of the southern three wells in the well field. Maximum drawdown in the North Well Field was 150 feet at North Well Field Well 3, with an initial depth to water at that location of 20 feet. Average maximum drawdown across all wells in the field was 68 feet. Drawdown in the vicinity of the alluvial fan springs located west of Goshute Lake was less than 1 foot with an estimated starting depth to groundwater in the valley-fill aquifer of 50 feet. The 1-foot contour also extends under the southern quarter of Goshute Lake and an ephemeral reach of Duck Creek. Impacts to Goshute Lake, Duck Creek and springs to the west, however, would be unlikely for reasons previously discussed in **Section 4.2.2.3**.

Seven active water rights occur within predicted drawdowns. One is near the southern-most well and would be in a drawdown zone of greater than 10 feet, while the remaining six would be northeast of the well field in areas of less than 2 feet of drawdown. There would be a long-term and minor impact for those wells in areas of less than 2 feet of drawdown, while the impact would be long-term and moderate to major for the well in a drawdown zone greater than 10 feet. The North Well Field would affect fewer active water rights than the Lages Station (8) or Reduced Lages Station with Coyote Valley Ranch (17) Well Fields, but more than the Middle (1) or South (5) Well Fields.

Table 4.2-2 provides a comparison of the groundwater pumping water supply alternatives in relation to active water rights affected, while Maps 34-79 and Appendix D of EMS-I (2008) depict the locations of affected water rights and disclose the names of their holders.

TABLE 4.2-2. SUMMARY OF WATER RIGHTS AFFECTED BY THE ALTERNATIVE ACTION AND ALTERNATIVE WATER SUPPLY SCENARIOS

WATER SUPPLY LOCATION	NUMBER OF ACTIVE WATER RIGHTS WITHIN DRAWDOWN CONTOURS (50-YEAR)									
	1-2 FT.	2-3 FT.	3-4 FT.	4-5 FT.	5-6 FT.	6-7 FT.	7-8 FT.	8-9 FT.	9-10 FT.	>10 FT.
Lages Station	1	1	0	0	2	3	1	0	0	0
Reduced Lages Station w/ Coyote Valley Ranch Well Field (Alt)	3	2	7	2	1	0	1	0	0	1
North Well Field (Alt)	4	2	0	0	0	0	0	0	0	1
Middle Well Field (Alt)	1	0	0	0	0	0	0	0	0	0
South Well Field (Alt)	0	4	0	1	0	0	0	0	0	0

Source: EMS-I (2008)

Middle Well Field

Impacts associated with this water supply alternative would be identical to those described in the Proposed Action under **Section 4.2.2.3**, with the exception of varying length in the water supply pipeline to the North Plant Site.

South Well Field

Impacts associated with this water supply alternative would be identical to those described in the Proposed Action under **Section 4.2.2.3**, with the exception of varying length in the water supply pipeline to the North Plant Site.

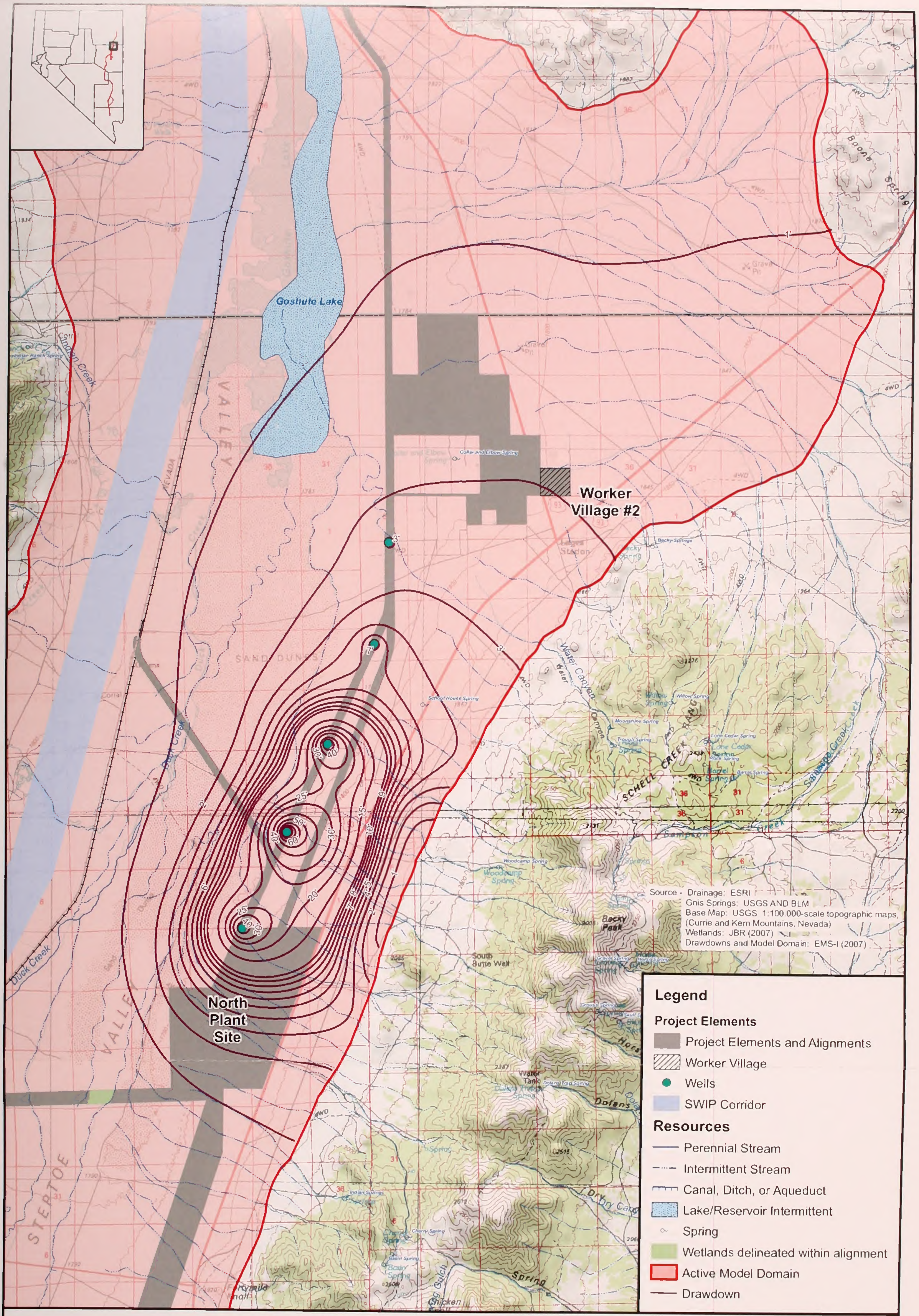


FIGURE 4.2-6
NORTH WELL FIELD MAXIMUM DRAWDOWN - 50 YEARS
ELY ENERGY CENTER

4.2.3.5 Mitigation

Additional mitigation measures are not required.

4.2.3.6 Unavoidable Adverse Impacts on Water Resources

Unavoidable adverse impacts on water resources would be unlikely to occur as a result of surface disturbance associated with the North Plant Site Alternative, although permanent wetland impacts would be predicted under electric transmission facilities Segment 1B and alternative Segment 1A. Any additional wetland impacts would be mainly limited to maintenance of the NNRy and would be minimal, and the implementation of BMPs would minimize potential water quality degradation and localized flooding associated with other project elements. Although there are special flood hazard areas associated with the proposed electric transmission facilities that may be unavoidable, these impacts are not anticipated to be adverse, since the footprint of transmission line pole structures is negligible when compared to the total area of the special flood hazard zone that would be impacted.

Unavoidable adverse impacts on water resources as a result of groundwater pumping for the water supply alternatives are possible. Extensive groundwater modeling of the pumping alternatives has been conducted by EMS-I (2008) and evaluated by Mayo (2007b). The most likely potential for impacts is in the area of active water rights. Water rights are present within each of the groundwater supply affected areas. Reduced productivity and/or additional lift costs are possible for those active water rights located within drawdown cones produced as a result of the groundwater supply alternatives. Unavoidable adverse impacts to Steptoe Slough and Basset Lake as a result of groundwater pumping are unlikely to occur.

4.2.3.7 Irreversible and Irretrievable Commitments of Resources

As discussed in **Section 4.2.2.7**, a total of 8,000 AFY of water would be required for the operation of the power plant facility. Extensive modeling and analysis (EMS-I 2008; Mayo 2007b) has been conducted on each of the alternative groundwater pumping water supply scenarios for the project. Each of these alternatives would require the dedication of 8,000 AFY of water in order for the plant to operate as designed, and this would represent an irretrievable commitment of groundwater or surface water resources for the duration of the project (50 years).

4.2.3.8 Relationship of Short-term Uses and Long-term Productivity

The relationship of short-term uses and long-term productivity would be the same as that for the Proposed Action as described in **Section 4.2.2.8**.

4.2.4 No Action Alternative

Under the No Action Alternative, surface water resources would not be impacted by construction or operation/maintenance activities. Drainages, streams, and wetlands would remain in their currently-functioning state and would not be affected. Private groundwater rights that would be acquired for the project would remain available for usage in other activities or projects, as would the surface water rights associated with KCC's Duck Creek impoundment. Similar impacts to those described above could occur if those water rights were utilized in a similar manner to the Proposed Action or alternatives.

4.2.3.4 Direct and Indirect Effects on Water Resources from Rail Facilities

Construction

Surface Water Resources

New construction of a rail lead would occur from the NNRy to the North Plant Site. The new construction of the rail lead from the NNRy to the North Plant Site would not directly or indirectly affect any surface water resources, including wetlands. Sanitary wastewater produced along the rail line construction project would be managed with portable facilities and sanitary waste would be trucked to a POTW for disposal. BMPs would be implemented to avoid and/or minimize surface water quality impacts during the construction phase.

Impacts associated with the Alternative Rail Line would be identical to those described in the Proposed Action under **Section 4.2.2.4**, with the exception of varying length in the Alternative Rail Line to the North Plant Site.

Groundwater Resources

The construction of the rail lead would require construction water for dust control and earth compaction. This water would be purchased from existing water right users and trucked to the place of use. Impacts to groundwater resources from this practice would be temporary and negligible to minor.

Water for construction of the Alternative Rail Line would also be acquired from existing water rights in the area and trucked to the construction site for use in compaction and dust control. This water withdrawal would impact groundwater levels locally at the well locations, but not more than allowed by the existing water right. This impact would be short-term and negligible.

The construction of the Alternative Rail Line would not affect groundwater quality.

Operations, Maintenance, and Abandonment

Surface Water Resources

Maintenance of the NNRy ROW may require periodic wetland and surface water impacts, including culvert replacement, maintenance of rail embankments, and maintenance road crossing access. These impacts would be covered under Nationwide Permit No. 3 – Maintenance (assuming the impact activities were previously permitted at the onset of construction), and they would be minimized or avoided through the use of BMPs. There are no surface water resources that would be affected by the operation and/or maintenance of the rail lead.

Operation and maintenance under the Alternative Rail Line would be unlikely to affect surface water resources. Culverts to address hydrology concerns would be installed during construction, and periodic maintenance/monitoring would be conducted to insure that they are properly functioning and appropriately located. A permanent maintenance road adjacent to the rail line would be constructed at grade to prevent interruption of east-west flowpaths. Since wetlands and/or special flood hazard areas are not present along the Alternative Rail Line, operation and maintenance impacts to surface water resources would be negligible. These impacts would be long-term and minor.

Groundwater Resources

Operation, maintenance, and abandonment of the rail lead or the Alternative Rail Line would not affect groundwater resources.

4.3 Geology and Minerals

4.3.1 Indicators and Methods

The primary indicator for geology and minerals resources is the number and type of claims in the project area disturbance footprint.

4.3.2 Proposed Action: South Plant Site

4.3.2.1 Direct and Indirect Effects on Geology and Minerals from Plant Site

Construction

The proposed plant site, Mt. Wheeler Transmission Line, and associated worker village, would be located on Quaternary coarse alluvial fans, finer basin-fill, and lake bed and playa deposits. All of the common fill material required for construction of the plant would be obtained from within the plant site. Aggregate mineral materials required for concrete would be purchased from sources outside of the plant site. The locations of these sources are currently unknown. Mining of these materials is federally regulated as common mineral materials that are not subject to mining claims or mineral leases. Existing mining claims and mineral leases would be existing prior rights that would be taken into consideration in siting any new federally approved mineral materials pits so it is unlikely that the development of the necessary pits for this project would impact mining claims or mineral leases. Proximity of these pits to other federal ROWs is unknown at this time.

There are no authorized mining claims, leasable mineral leases, mineral material sale contracts, nor solar energy or wind ROWs, present within 2 miles of the proposed plant site that could be impacted. The anticipated level of impacts to geology and minerals would be negligible for construction of the proposed plant site.

Operations, Maintenance, and Abandonment

The anticipated level of impacts to geology and minerals from the operations, maintenance, and abandonment of the power plant would be negligible.

4.3.2.2 Direct and Indirect Effects on Geology and Minerals from Electric Transmission Facilities

Construction

The electric transmission facilities would be located on Quaternary basin-fill deposits, Tertiary volcanics, Permian to Ordovician shallow marine sedimentary deposits, and Precambrian basement rocks. The electric transmission facilities would cross up to nine different mountain ranges and 11 different valleys. The construction of the electrical transmission line could locally alter surface topography.

There are no authorized mining claims, geothermal leases, coal authorizations, solar energy and wind ROWs, or oil shale leases present within 2 miles of the electric transmission facilities that could be impacted. There are 26 active oil and gas leases and four mining districts located within the same township, range, and section of the electric transmission facilities. The impacts to geology and minerals from the construction of the proposed transmission lines would be negligible.

Operations, Maintenance, and Abandonment

Access roads may actually increase accessibility to authorized mining claims, geothermal leases, solar energy and wind ROWs, and oil shale leases. The anticipated level of impacts to

geology and minerals from the operations and maintenance of the electric transmission facilities would be negligible.

4.3.2.3 Direct and Indirect Effects on Geology and Minerals from Water Supply Facilities

Construction

The water supply facilities would be located on Quaternary coarse alluvial fans, finer basin-fill, and lake bed and playa deposits. Aggregate mineral materials required for bedding buried pipes would be purchased from sources outside of the plant site. The specific locations of these sources are currently unknown but sufficient supplies are available at existing, private aggregate suppliers in the project area. Mining of these materials on federal property is federally regulated as common mineral materials that are not subject to mining claims or mineral leases. Existing mining claims and mineral leases would be existing prior rights that would be taken into consideration in siting any new federally approved mineral materials pits so it is unlikely that the development of the necessary pits for this project would impact mining claims or mineral leases. Proximity of these pits to other federal ROWs is unknown at this time.

There are no authorized mining claims, oil and gas leases, geothermal leases, coal authorizations, solar energy ROWs, wind ROWs, and or oil shale leases present within 2 miles of the water supply facilities that could be impacted. The anticipated level of impacts to geology and minerals from construction of the water supply facilities would be long-term and minor.

Operations, Maintenance, and Abandonment

Access roads may actually increase accessibility to authorized mining claims, geothermal leases, coal authorizations, solar energy and wind ROWs, and oil shale leases. The anticipated level of impacts to geology and minerals from the operations and maintenance of the water supply facilities would be negligible.

4.3.2.4 Direct and Indirect Effects on Geology and Minerals from Rail Facilities

Construction

The Alternative Rail Line would be located on Quaternary coarse alluvial fans, finer basin-fill, and lake bed and playa deposits. Borrow material for grading the line would largely be obtained from within the ROW. Sub-ballast and ballast material would be quarried outside of the ROW from existing privately-owned sources in currently unknown locations. Mining of these materials on federal property is federally regulated as common mineral materials that are not subject to mining claims or mineral leases. Existing mining claims and mineral leases would be existing prior rights that would be taken into consideration in siting any new federally approved mineral materials pits so it is unlikely that the development of the necessary pits for this project would impact mining claims or mineral leases. Proximity of these pits to other federal ROWs is unknown at this time.

There are no authorized mining claims, oil and gas leases, geothermal leases, coal authorizations, solar energy and wind ROWs, or oil shale leases present within 2 miles of the Alternative Rail Line that could be impacted. The anticipated level of impacts to geology and minerals from construction of the Alternative Rail Line would be negligible.

Operations, Maintenance, and Abandonment

Access roads may actually increase accessibility to authorized mining claims, geothermal leases, coal authorizations, solar energy and wind ROWs, and oil shale leases. The anticipated level of impacts to geology and minerals from the operations and maintenance of the Alternative Rail Line would be negligible.

4.3.2.5 Mitigation

Additional mitigation measures are not required.

4.3.2.6 Unavoidable Adverse Impacts on Geology and Minerals

Slight topographic modifications would cause minor unavoidable impacts on geology. There would be no unavoidable adverse impacts to mineral resources.

4.3.2.7 Irreversible and Irretrievable Commitments of Resources

The commitment of the proposed ROWs related to the Proposed Action could affect access to future mineral production at currently unknown locations near the proposed ROWs.

4.3.2.8 Relationship of Short-term Uses and Long-term Productivity

There currently are no known effects to geologic formations or long-term mineral resource productivity due to the construction and operation of the facilities in the proposed ROWs.

4.3.3 North Plant Site Alternative

4.3.3.1 Direct and Indirect Effects on Geology and Minerals from Plant Site

Construction

Due to the similarity of geologic resources, impacts to the North Plant Site would be similar to those discussed for the Proposed Action.

There are no authorized mining claims, oil and gas leases, coal authorizations, solar energy and wind ROWs, or oil shale leases present within 2 miles of the proposed power plant site that could be impacted. The anticipated level of impacts to geology and minerals would be negligible for construction of the North Plant Site.

Operations, Maintenance, and Abandonment

The anticipated level of impacts to geology and minerals from the operations, maintenance, and abandonment of the power plant would be similar to the Proposed Action.

4.3.3.2 Direct and Indirect Effects on Geology and Minerals from Electric Transmission Facilities

Construction

The electric transmission facilities would be located on Quaternary basin-fill deposits, Tertiary volcanics, Permian to Ordovician shallow marine sedimentary deposits, and Precambrian basement rocks. The electric transmission facilities would cross up to nine different mountain ranges and through up to 11 different valleys. The construction of the electrical transmission line could alter surface topography.

With one exception, there are no authorized mining claims, geothermal leases, coal authorizations, solar energy and wind ROWs, or oil shale leases present within 2 miles of the electric transmission facilities that could be impacted. There is one active geothermal lease located on the electrical transmission line Segment 1B ROW. There are 26 active oil and gas leases, four mining districts, and one active geothermal lease located within the same township, range, and sections of the electric transmission facilities. The anticipated level of impacts to geology and minerals would be long-term and minor for the construction of the electric transmission facilities.

Operations, Maintenance, and Abandonment

The anticipated level of impacts to geology and minerals from the operations, maintenance, and abandonment of electric transmission facilities and associated access roads would be negligible.

4.3.3.3 Direct and Indirect Effects on Geology and Minerals from Water Supply Facilities

Construction

The water supply facilities alternatives would all be located on Quaternary coarse alluvial fans, finer basin-fill, and lake bed and playa deposits. The requirements for off-site aggregate materials would be the same as for the Proposed Action.

There are no authorized mining claims, leasable mineral leases, mineral material sale contracts, nor solar energy or wind ROWs present within 2 miles of the water supply facilities that could be impacted. The anticipated level of impacts to geology and minerals would be negligible for construction of the water supply facilities.

Operations, Maintenance, and Abandonment

The anticipated level of impacts to geology and minerals from the operations, maintenance, and abandonment of water supply facilities and associated access roads would be negligible.

4.3.3.4 Direct and Indirect Effects on Geology and Minerals from Rail Facilities

Construction

The Alternative Rail Line would be located on Quaternary coarse alluvial fans, finer basin-fill, and lake bed and playa deposits. The requirements for off-site aggregate materials for the Alternative Rail Line for the North Plant Site would be similar to those for the South Plant Site but less of these materials would be required because the rail line would be shorter.

There are no authorized mining claims, leasable mineral leases, mineral material sale contracts, nor solar energy or wind ROWs present within 2 miles of the Alternative Rail Line that could be impacted. The anticipated level of impacts to geology and minerals would be negligible for construction of the Alternative Rail Line.

Operations, Maintenance, and Abandonment

The anticipated level of impacts to geology and minerals from the operations, maintenance, and abandonment of electric transmission facilities and associated access roads would be negligible.

4.3.3.5 Mitigation

Additional mitigation measures are not required.

4.3.3.6 Unavoidable Adverse Impacts on Geology and Minerals

Unavoidable adverse impacts would be the same as for the Proposed Action.

4.3.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be essentially the same as for the Proposed Action.

4.3.3.8 Relationship of Short-term Uses and Long-term Productivity

Relationships of short-term uses and long-term productivity would be essentially the same as for the Proposed Action.

4.3.4 No Action Alternative

The No Action Alternative would result in no effect on geology and mineral resources at or near the proposed project site.

4.4 Paleontological Resources

4.4.1 Indicators and Methods

The analysis of impacts to paleontological resources is based on a project-specific paleontological resources assessment that included a literature review of known resources, field survey, and assignment of paleontological sensitivity based on sediments. The following indicators were considered when analyzing potential impacts to paleontology:

- Known paleontological resources
- Proximity to geologic strata with potential to contain paleontological resources
- Depth of excavations associated with project components

Impacts to specific paleontological resources are not presented, as paleontological resources are generally located by active discovery during surveys, by chance during man-made disturbances, by exposure due to erosion, or other means. Known paleontological resources were reviewed and used to determine potential paleontological sensitivities as presented in **Section 3.4**.

4.4.2 Proposed Action: South Plant Site

4.4.2.1 Direct and Indirect Effects on Paleontological Resources from Plant Site

Construction

The plant site would cover up to approximately 3,000 acres (up to 2,500 acre land transfer and 500-acre ROW), one-third of which would be landfill area and evaporation ponds. Excavation related to plant construction would generally reach less than 30 feet, but excavation could be as deep as 80 feet below certain facilities.

No fossil localities have been recorded in the plant site. However, the potential exists for significant, nonrenewable paleontological resources to be encountered in Pleistocene sediments located below the surface of the South Plant Site. Sediments with high potential (Reynolds 2007) to contain paleontological resources are present at approximately 6 to 7 feet below surface. Sediments in the area of the associated worker village include areas with low paleontological sensitivity and other areas with high paleontological sensitivity at 5 feet below surface.

Excavation for transmission line towers for the Mt. Wheeler Transmission Line would be up to 30 feet deep. However, the transmission line crosses sediments with low paleontological sensitivity.

If paleontological resources were encountered during construction activities related to the South Plant Site, mitigation measures described in **Section 4.4.2.5** would apply.

Operations, Maintenance, and Abandonment

No additional excavation would occur during operations, maintenance, and abandonment, therefore, no additional impacts to paleontological resources would occur as a result of operations, maintenance, or abandonment of the power plant site.

4.4.2.2 Direct and Indirect Effects on Paleontological Resources from Electric Transmission Facilities

Construction

The Robinson Summit Substation would cover approximately 80 acres. Excavation would be up to 100 feet below surface. The Harry Allen Substation would expand by 40 acres and excavation would be up to 30 feet deep. The transmission line right-of-ways would be 200 feet wide with towers spaced approximately 1,600 feet apart. The tower footings would each be up to 12 feet in diameter and up to 30 feet in depth. Fiber optic regenerating stations associated with the transmission lines would measure 30 by 40 feet within the right-of-way.

There is high potential (Reynolds 2007) for encountering North American Land Mammal Age mammal fossils in the surface Miocene sandstones during construction of the Robinson Summit Substation. Excavation depths are not relevant as the significant paleontological resources, if present, would likely be encountered at surface levels. The Harry Allen Substation expansion would occur within a dry lake bed of Pleistocene gravels with low potential for significant paleontological resources at the surface. Impacts to paleontological resources in this area would be negligible.

Potential impacts from the construction of the transmission lines over areas with potential for paleontological resources would be minimized by spanning most areas under the transmission lines and disturbing relatively small areas with the support structures. Impacts to paleontological resources would be minor along the transmission line corridors. If paleontological resources were encountered during construction activities related to the electric transmission facilities, mitigation measures described in **Section 4.4.2.5** would apply.

Operations, Maintenance, and Abandonment

No additional impacts to paleontological resources would occur as a result of operations, maintenance, or abandonment of the transmission lines.

4.4.2.3 Direct and Indirect Effects on Paleontological Resources from Water Supply Facilities

Construction

Wells would be drilled to depths of hundreds of feet. Depths of buried pipelines would be variable and dependent on topography but would range from 5 to 15 feet deep. Associated pumping stations would be above grade but would have sumps excavated below grade.

No known fossil localities have been recorded in the area of the proposed water supply facilities. The Lages Station Well Field would encounter the Pleistocene valley fill deposits that have a high paleontological sensitivity and are generally covered by no more than 2 feet of Holocene sediments. These Pleistocene sediments would be encountered in the well drilling and pipeline construction.

A portion of the Lages Water Line, from the area where it diverges to the west from the South Plant Site to the north where it approaches US-93 (Section 16 T19N R64E), traverses through fine-grained sediments with potential to contain significant vertebrate fossils. The water line would be buried between 5 and 15 feet deep, therefore these fine grained Pleistocene sediments that have the potential to contain fossil Ice Age vertebrates at approximately 5 feet below the surface would likely be encountered. The portion of the line from the North Plant Site to Lages Station would be within Pleistocene sediments exposed at shallow depth below a shallow cover of deflated Holocene alluvium. The Pleistocene silts and sandy siltstones have a paleontological sensitivity designation of high at surface.

The Coyote Valley Ranch Well Field would be located in an area with fine-grained Pleistocene sediments that have the potential to contain fossil Ice Age vertebrates at approximately 5 feet below the surface; therefore it is likely these sediments would be encountered.

The North Well Field would be within Pleistocene sediments exposed at shallow depth, generally covered by no more than 2 feet of Holocene sediments; therefore these paleontologically sensitive sediments would be encountered.

The Middle Well Field would be in fanglomeratic sediments with low potential to contain significant vertebrate fossils; therefore it is unlikely that sensitive paleontological resources would be encountered.

The South Well Field and Limited South Well Field alternatives are partially located within fine-grained sediments that have potential to contain significant vertebrate fossils at approximately 5 feet below the surface; therefore it is likely these sediments would be encountered.

The Duck Creek Water Line runs westerly through Holocene fanglomerate in the canyon bottom, and pipeline construction could encounter sediments which have high potential to contain vertebrate fossils. The remaining portion of the water line would be constructed through a low potential area; therefore it is unlikely that sensitive paleontological resources would be encountered.

If paleontological resources were encountered during construction activities related to the water supply facilities, mitigation measures described in **Section 4.4.2.5** would apply.

Operations, Maintenance, and Abandonment

No additional impacts to paleontological resources would occur as a result of operations, maintenance, or abandonment of the water supply facilities.

4.4.2.4 Direct and Indirect Effects on Paleontological Resources from Rail Facilities

Construction

Alternative Rail Line

In flat topography, the Alternative Rail Line ROW excavation depth would be up to 6 feet. In the undulating or steeper areas, the maximum depth of cut along the Alternative Rail Line is estimated to be 25 to 30 feet deep. The excavation/cuts associated with the construction of the Alternative Rail Line in the northern Steptoe Valley would occur in the vicinity of high elevation Pleistocene sediments associated with Goshute Lake (Reynolds 2007) that have the potential to contain vertebrate fossils.

South Plant Site Rail Lead

The rail lead from the NNRy to the South Plant Site would be within the flat valley bottom where the ROW excavation depth would be up to 6 feet and cross sediments with high paleontological sensitivity 5 feet below surface.

If paleontological resources were encountered during construction activities related to the rail facilities, mitigation measures described in **Section 4.4.2.5** would apply.

Operations, Maintenance, and Abandonment

No additional impacts to paleontological resources would occur as a result of operations, maintenance, or abandonment of the Alternative Rail Line or rail lead.

4.4.2.5 Mitigation

1. A trained paleontological monitor will be present during ground-disturbing activities within the project area in sediments determined through pre-construction surveys as being likely to contain significant paleontological resources (i.e., high paleontological sensitivity).
2. Upon encountering a large deposit of bone, salvage of bone will be conducted with additional field staff and in accordance with modern paleontological techniques.
3. Fossils collected during the project will be prepared to a reasonable point of identification.
4. A report documenting the results of the monitoring and salvage activities and the significance of the fossils will be prepared.
5. Fossils collected during this work, along with the itemized inventory of these specimens, will be deposited in a museum repository for permanent curation and storage.

4.4.2.6 Unavoidable Adverse Impacts on Paleontological Resources

There would be no unavoidable adverse impacts to paleontological resources.

4.4.2.7 Irreversible and Irretrievable Commitments of Resources

Paleontological resources discovered during construction activities would be removed and this would be an irreversible commitment of these resources. However, these resources would be curated and available for study and/or exhibit providing a beneficial commitment of these resources.

4.4.2.8 Relationship of Short-term Uses and Long-term Productivity

In the short term, paleontological resources encountered during construction activities could be destroyed or degraded, however implementation of the PRIMP would mitigate these potential impacts. There would not be impacts to long-term productivity.

4.4.3 North Plant Site Alternative

4.4.3.1 Direct and Indirect Effects on Paleontological Resources from Plant Site Construction

There are no known paleontological resources within the plant site. Sediments with high potential to preserve paleontological resources are present at approximately 6 feet below the surface of the North Plant site.

Sediments in the associated worker village area include areas of both low paleontological sensitivity and high paleontological sensitivity at 5 feet below surface.

Mt. Wheeler Transmission Line

Excavation for the Mt. Wheeler Transmission Line towers would be up to 30 feet deep. The majority of the transmission line crosses sediments with low paleontological sensitivity with an area of high paleontological sensitivity at 5 feet below surface where it heads west and then north across US-93. It crosses high paleontological sensitivity sediments again as it crosses the north plant site and continues to its termination at the associated worker village; therefore it is likely these sediments would be encountered.

If paleontological resources were encountered during construction activities related to the North Plant Site Alternative, mitigation measures described in **Section 4.4.2.5** would apply.

Operations, Maintenance, and Abandonment

No additional excavation would occur during operations, maintenance, and abandonment, therefore, no impacts to paleontological resources would occur as a result of operations, maintenance, or abandonment of the North Plant site.

4.4.3.2 Direct and Indirect Effects on Paleontological Resources from Electric Transmission Facilities

Construction

These impacts would be essentially the same as those described in **Section 4.4.2.2**. If paleontological resources were encountered during construction activities related to the electric transmission facilities, mitigation measures described in **Section 4.4.2.5** would apply.

Operations, Maintenance, and Abandonment

No additional impacts to paleontological resources would occur as a result of operations, maintenance, or abandonment of the transmission facilities.

4.4.3.3 Direct and Indirect Effects on Paleontological Resources from Water Supply Facilities

Construction

These impacts would be essentially the same as those described in **Section 4.4.2.3**, except it would not include the potential impacts to paleontological resources south of the North Plant site. If paleontological resources were encountered during construction activities related to the water supply facilities, mitigation measures described in **Section 4.4.2.5** would apply.

Operations, Maintenance, and Abandonment

No additional impacts to paleontological resources would occur as a result of operations, maintenance, or abandonment of the water supply facilities.

4.4.3.4 Direct and Indirect Effects on Paleontological Resources from Rail Facilities

Construction

The impacts for the Alternative Rail Line would be essentially the same as those described in **Section 4.4.2.4**.

The rail lead from the NNRy to the North Plant Site would be within the flat valley bottom where the ROW excavation depth would be up to 6 feet. This rail lead would cross sediments with high paleontological sensitivity at surface and at 5 feet below surface; therefore it is likely these sediments would be encountered.

If paleontological resources were encountered during construction activities related to the rail facilities, mitigation measures described in **Section 4.4.2.5** would apply.

Operations, Maintenance, and Abandonment

No additional impacts to paleontological resources would occur as a result of operations, maintenance, or abandonment of the Alternative Rail Line or the rail lead.

4.4.3.5 Mitigation

The mitigation would be the same as described in **Section 4.4.2.5**.

4.4.3.6 Unavoidable Adverse Impacts on Paleontological Resources

There would be no unavoidable adverse impacts to paleontological resources.

4.4.3.7 Irreversible and Irretrievable Commitments of Resources

Paleontological resources would be removed during construction activities and this would be an irreversible commitment of these resources. However, these resources would be curated and available for study and/or exhibit providing a beneficial commitment of these resources.

4.4.3.8 Relationship of Short-term Uses and Long-term Productivity

In the short term, paleontological resources encountered during construction activities could be destroyed or degraded, however implementation of the mitigation measures would minimize these potential impacts. There would not be impacts to long-term productivity.

4.4.4 No Action Alternative

Under the No Action Alternative, there would be no EEC related impacts to paleontological resources.

4.5 Soils

4.5.1 Indicators and Methods

Indicators used to assess potential impacts to soil resources include the following:

- Acres of soil disturbance and acres to be reclaimed
- Suitability of growth medium for reclamation

4.5.2 Proposed Action: South Plant Site

Direct impacts to soil resources include loss of soil during salvage, sediment loss due to erosion, and reduced productivity. Indirect impacts related to soil resources include water quality degradation related to erosion and reduced viability of vegetation related to soil fertility factors.

Potential impacts to soil resources would be similar for the Proposed Action and all Action Alternatives except the No Action Alternative.

4.5.2.1 Physical Changes to Soil Resources

Surface disturbance and removal of soil resources for replacement during reclamation activities would result in direct impacts within the project area. Cut and fill would be balanced to minimize off-site fill and disposal of spoils. It is anticipated that all of the required borrow materials for general grading would be obtained from the plant site and areas associated with other disturbance. Physical and chemical changes to the soil would be expected to be long-term and minor and would occur by mixing during initial salvage operations and when placed in stockpiles for future reclamation use. Soil that is restored to disturbed areas immediately after construction would begin to conform to more natural conditions. Soil that is stored for extended periods of time in stockpiles for future reclamation use would continue to be affected by compaction and lack of aeration.

Microorganisms such as bacteria and fungi are important in the decomposition of biological materials and the formation and improvement of soil itself (AEHS 2002). Natural processes, such as dust blowing on the site from other areas, would reinoculate the site with these microorganisms. Root penetration and the development of a rhizosphere environment are also thought to perpetuate the growth of microorganisms (AEHS 2002). Microbiotic soil crusts are recognized as an important aspect of soil quality (BLM 2008a) and damage to these crusts

would occur during disturbance, reducing soil quality by increasing erosion potential and changing the properties of the associated soil.

Direct physical impacts to soil resources include compaction and crushing of the soil and soil crust by equipment during salvage, and stockpiling during construction and subsequent replacement during reclamation. Physical effects of soil compaction would be short-term, minor to moderate, and include reduced permeability and porosity, damage to microbiotic crusts, increased bulk density, decreased available water holding capacity, increased erosion potential, reduced gaseous exchange, and loss of soil structure.

4.5.2.2 Productivity

Productivity is defined as the rate of vegetation production per unit area, usually expressed in terms of weight or energy. Primary factors that influence natural soil productivity include length of growing season, climate and soil depth, and production/fertility. Soil erosion, combined with other impacts from disturbances such as soil compaction, can reduce soil quality and soil productivity (USDA 2007b). As identified in the Ely RMP (BLM 2008a), soil productivity and soil quality are generally stable, but some areas associated with management actions (such as weeds, fire, livestock, recreation, travel, etc.) show declines.

Production and fertility of the stockpiled growth medium would be directly affected by mixing of the soils during salvage operations. Incorporation of slash and vegetative materials into the growth medium during stripping would increase the organic matter content of the material and elevate the production potential. Mixing of soils with low coarse fragment content together with soils of high coarse fragment content would serve to dilute the coarse fragment content and is likely to increase the production potential of the growth medium.

The total volume of growth medium available for reclamation activities would come from salvage of material from disturbed areas. The quality of these mixed salvage soils is likely to be similar to or slightly better than the characteristics of the individual soils prior to disturbance.

The amount of reclaimed acreage would be significantly less than the total disturbance acreage. Recovered soils available would be salvaged from all disturbance areas, including permanently disturbed areas that would not be reclaimed, and would be expected to provide suitable depth to achieve adequate and uniform coverage for seedbed preparation and reclamation. Growth medium suitability parameters have been identified in Chapter 3 and revegetation species would meet the criteria set by the BLM.

Soil compaction can contribute to soil erosion and reduced soil productivity. Soils in the area of the Proposed Action or Action Alternatives characteristically have a high percentage of coarse fragments, which would provide moderate support for heavy equipment by reducing the amount of compression on the underlying soils. Productivity loss due to compaction influences would be moderate to significant at the plant site and other isolated areas where heavy equipment traffic or fine-grained soils occur. Productivity loss due to compaction influences would be negligible to minor along the electric transmission facilities, water supply pipeline, and rail facilities with implementation of the Proposed Action or the Action Alternatives.

4.5.2.3 Soil Loss/Erosion

A portion of the soils within the project area would be physically lost during salvage and replacement operations through mechanical and erosion effects. Soil mixing and loss of some soil would also occur during final growth medium distribution and completion of reclamation.

Soil erosion potential is determined based on physical soil characteristics, k-factor rating, and slope. Areas located on steep slopes are inherently susceptible to erosion. Slope values for reclaimed areas under the Proposed Action and Action Alternatives would tend to have few steep areas. Exceptions to this would include side slopes of reclaimed parts of the combustion products landfill and cut or fill slopes along the Alternative Rail Line. These would represent a relatively small proportion of the entire disturbed area. The majority of reclaimed areas identified in the project area and Action Alternative would incorporate a generally flat to gently sloped surface during regrading and reclamation activities.

Erosion would occur in areas of new or increased surface disturbance. Potential for erosion would be increased on disturbed areas after soil salvage operations due to removal of the vegetative cover and the loss of surface soil structure. Erosion of growth medium after redistribution on regraded sites would also have a greater potential until the soil is stabilized by successful revegetation. Soil characteristics identified in **Section 3.5.4** suggest that disturbed areas would experience moderate to high erosion potential, either by wind or water. Wind erosion hazard is expected to be low to moderate due to characteristic soil features, such as the high percentage of coarse fragments throughout the soil profiles of many soils in the project area (USDA 2007c). Windblown dust would result from disturbance of fine-textured soils during construction activities and until completion of reclamation.

4.5.2.4 Direct and Indirect Effects on Soils from Plant Site

Construction

Construction activities during Phase 1 of the South Plant Site would take approximately 60 months and necessitate disturbance of soil resources throughout this construction period. As seen in **Table 4.5-1**, a total of 3,254 acres of soil resources would be disturbed. Borrow material for general grading of the South Plant Site would be obtained on site, eliminating the need for off-site borrow areas. The associated worker village and access road would temporarily disturb 257 acres of soil resources and reclamation of the site and access road following the power plant construction would restore the soil to productivity. The Mt. Wheeler Transmission Line elements would temporarily disturb up to 113 acres, which would be restored to productivity after reclamation, with the exception of the small permanent disturbances associated with the power poles and any maintenance access roads within the ROW.

Heavy construction equipment such as earthmovers, cranes, material handlers, and trucks would be utilized to clear and grade the site for construction activities. Clearing limits would be defined on the site work plan to avoid direct impacts to soils outside the project limit.

TABLE 4.5-1. ACRES OF SOIL DISTURBANCE FOR THE SOUTH PLANT SITE

PROJECT ELEMENTS	ACRES OF SOIL RESOURCES		
	DISTURBED	TEMPORARILY DISTURBED/ RECLAIMED	PERMANENTLY DISTURBED
South Plant Site Disposal Area ROW	 2,486 493	 0 0	 2,486 493
Mt. Wheeler Transmission Line	113	95	18
Associated Worker Village (includes access road)	162	162	0
TOTAL	**3,254**	**257**	**2,997**

With implementation of growth medium salvage and reuse practices, soil conservation measures, BMPs, and other proposed operating procedures, the impacts to soil resources on the reclaimed areas of the Proposed Action would be site-specific, temporary, and moderate. The remaining unreclaimed acres would be disturbed and taken out of productivity for the long term. This would be a long-term major impact to soil resources within these areas. As phases of the combustion products landfill are completed over the life of the plant, salvaged soil resources disturbed by the footprint of this facility would be used for reclamation.

Operations, Maintenance, and Abandonment

Impacts to soil resources resulting from the operation, maintenance, and abandonment of the South Plant Site would be limited to disturbances at the outer margins of the plant site property during fence line maintenance. These impacts would be short-term and minor.

Impacts to soil resources at the associated worker village would be limited to areas located along the access road, where short-term, negligible disturbance may occur during routine road grading and maintenance.

Operation and maintenance impacts along the Mt. Wheeler Transmission Line would be short-term and negligible to minor as a result of power line maintenance.

The chemical breakdown of rock-forming minerals and their subsequent conversion into soil materials, termed *soil mineral weathering*, is the primary source of mineral nutrients such as Ca, Mg, and K in soils, which are lost from soils via natural acidic leaching and/or biomass loss (Miller 2006). The make-up of the parent rocks, ambient temperatures, vegetation type, precipitation regime, and elevation of the soils can all affect the availability of soils to absorb and neutralize the effects of nitrogen and sulfur deposition. As described in **Section 4.6**, emissions from coal-fired power plants could include nitrogen and sulfur compounds. These potential air pollutants are transported in the atmosphere and deposited on the land surface through various means. Nitrogen and sulfur deposition from power plant emissions can exceed a soil's natural ability to absorb and neutralize these constituents decreasing the pH of the soil, increasing soluble soil aluminum concentration, and leading to a depletion of mineral nutrients, especially Ca, Mg, and K (Miller 2006).

4.5.2.5 Direct and Indirect Effects on Soils from Electric Transmission Facilities

Potential disturbance impacts to soil resources for the various segments and components of the electric transmission facilities are listed in **Table 4.5-2**. The majority of the impacts would be temporary, although the actual footprints of the structures and the substations would result in permanent impacts to soil resources. Cutting of trees and removal of vegetation may occur, but downed vegetation and undisturbed low vegetation would be left in place within this disturbance corridor, where practicable, to serve as soil protection and erosion control. Vegetation would only be cleared to the extent necessary, minimizing impacts to soil resources.

TABLE 4.5-2. ACRES OF SOIL DISTURBANCE FOR ELECTRIC TRANSMISSION FACILITIES

PROJECT ELEMENTS	ACRES OF SOIL RESOURCES		
	DISTURBED	TEMPORARILY DISTURBED/ RECLAIMED	PERMANENTLY DISTURBED
Segment 4A (Lines 1 & 2)	348	334	14
Segment 1D (Lines 1 & 2)	682	558	124
Segment 1E (Lines 1 & 2)	14	8	6
Segment 3 (Lines 1 & 2) – Alt.	438	424	14
Segment 6A (Lines 1 & 2)	14	8	6
Segment 1G (Lines 1 & 2) - Alt	20	18	2
Segment 6C (Lines 1 & 2)	4,056	3,490	566
Segment 8 (Lines 1 & 2)	1,548	1,492	56
Segment 9A (Line 1)	128	96	32
Segment 9A (Lines 1&2) - Alt	256	192	64
Segment 9B (Lines 1 & 2)	336	326	10
Segment 9B (Line 1) - Alt	168	163	5
Segment 9C (Line 2)	115	91	24
Segment 9D (Lines 1 & 2)	610	530	80
Segment 9D (Line 1) - Alt	555	527	28
Segment 11 (Lines 1 & 2)	1,110	1,054	56
Segment 10 (Line 2) - Alt	657	572	85
Other Line Components	420	350	70
Robinson Summit Substation, includes 50-foot wide access road	82	0	82
Harry Allen Substation Expansion	40	30	10

Construction

At each transmission line structure site, typical temporary work areas would be approximately 1 acre in flat terrain and 1.5 acres in steep terrain, but the size may vary depending upon topography. When practicable, access within the work area would be via overland travel, with minimal to no grading required in the temporary work area. Soil resources would not be salvaged from temporary work areas unless these areas would be graded, then soil would be salvaged from the areas to be graded for reuse during reclamation. Soil would typically not be salvaged from areas to be permanently disturbed.

Work areas for tensioning equipment and pulling equipment would be approximately 200' x 700' and would be required about every 3 miles. These locations could require larger, less symmetrical pulling and tensioning sites for construction that occurs in steep or rough terrain.

After transmission line construction, all work areas identified as temporary disturbance on the structure location drawings would be reclaimed and salvaged topsoil would be respread during reclamation. No new off-site borrow areas would need to be developed specifically for construction of the transmission lines.

With implementation of growth medium salvage and reuse practices, soil conservation measures, BMPs, and other proposed operating procedures, the impacts to the temporarily disturbed acres of this resource would be site-specific, temporary, and moderate. The remaining acres would remain unreclaimed and would be permanently disturbed and taken out of productivity.

Operations, Maintenance, and Abandonment

Long-term periodic maintenance to the electric transmission lines and substations may require access to the corridors and substations via existing roads and may result in temporary disturbance; however, this effect would be minor to negligible.

4.5.2.6 Direct and Indirect Effects on Soils from Water Supply Facilities

Construction

Construction activities for the water supply facilities under the Proposed Action and the Action Alternatives would necessitate temporary and permanent disturbance impacts to soil resources as listed in **Table 4.5-3**. Temporary disturbance areas would be reclaimed and restored to productivity. Soil would be salvaged from areas of temporary disturbance to be reused during reclamation activities. Soil would not be salvaged from areas of permanent disturbance.

The Proposed Action Lages Station Well Field would include six well sites, each approximately 100' x 100' in size. Graveled 20-foot wide access roads would also be constructed between the well sites. Temporary ground disturbance during drilling and construction at each site would be approximately 300' x 300'. Removal of vegetation may occur anywhere in the disturbance footprint, but undisturbed low vegetation would be left in place within the temporary disturbance corridor, where practicable, to serve as soil protection and erosion control. Vegetation would only be cleared to the extent necessary, minimizing impacts to soil resources.

Water previously used for irrigation within the Lages Station Well Field would be redirected to industrial use. Prime farmlands (Kunzler-Sycomat association) previously irrigated in this area would likely cease to be irrigated. Previously tilled farmlands could become a source of fugitive dust unless stabilized from wind erosion.

The water pipeline would be buried with a minimum of 5 feet of cover and be paralleled with an access road. Excavation of the pipeline trench would be accomplished using machinery such as a tracked excavator or trenching machine. Spoil material from the excavation would be temporarily stored on-site. To the extent possible, the excavated material would be used as trench backfill.

If the pipeline were constructed without the Alternative Rail Line, a short-term construction ROW of 200 feet and a long-term ROW width of 60 feet would be required for the water pipeline. If the rail and pipeline were constructed in the same ROW, a short-term construction width of 300 feet and a long-term ROW of 200 feet would be shared by the rail and pipeline. The length of the pipeline from Lages Station Well Field to the South Plant Site would be approximately 44 miles.

A temporary construction yard or staging area would be required at the Lages Station Well Field and additional construction staging areas would be required at various locations along the pipeline routes. Development of temporary pipeline material yards would involve soil disturbance areas of approximately 150' x 250'. These material yards would be positioned within the waterline construction ROW about every 5 miles along the construction corridor. Soil would not typically be salvaged in these yard areas unless grading or gravelling were necessary, in which case topsoil would be salvaged from these areas.

TABLE 4.5-3. ACRES OF SOIL DISTURBANCE FOR WATER SUPPLY FACILITIES FOR THE SOUTH PLANT SITE

PROJECT ELEMENTS	ACRES OF SOIL RESOURCES		
	DISTURBED	TEMPORARILY DISTURBED/ RECLAIMED	PERMANENTLY DISTURBED
Proposed Action - Lages Station Well Field & Pipeline, includes Water Supply Line to South Plant Site	1,201	834	367
Water Supply – Alternative Reduced Lages w/Coyote Valley Ranch, includes Coyote Valley Ranch Well Field and Water Line	1,231	849	382
Duck Creek Impoundment/Pipeline Alternative	134	94	40
Middle Well Field Water Supply – Alternative	723	506	367
Reduced Lages w/Limited South Well Field	Same as Proposed Action – Lages Station Well Field, Pipeline and Water Supply Line		
South Well Field Water Supply – Alternative	191	133	58

With implementation of growth medium salvage and reuse practices, soil conservation measures, BMPs, and other proposed operating procedures, the impacts to soil resources on reclaimed areas of the Proposed Action or Action Alternatives would be site-specific, temporary, and moderate. Areas that remain unreclaimed would be permanently disturbed and taken out of productivity. Soil impacts on these areas would be site-specific, long-term and major.

Operations, Maintenance, and Abandonment

Periodic maintenance of all the water supply pipeline facilities would necessitate future temporary disturbance to the existing soil resources; however, this disturbance would be short-term and negligible.

4.5.2.7 Direct and Indirect Effects on Soils from Rail Facilities

Construction

The disturbance corridor footprint of the rail lead and the Alternative Rail Line are shown in **Table 4.5-4.** Impacts to soil resources for the Alternative Rail Line assume that the water supply pipeline would be constructed within the same ROW.

Soil disturbance would occur within the 300-foot disturbance corridor and cutting of trees and removal of vegetation may occur, but downed vegetation and undisturbed low vegetation would be left in place within this disturbance corridor, where practicable, to serve as soil protection and erosion control. Vegetation would only be cleared to the extent necessary, minimizing impacts to soil resources.

Railroad construction would require extensive grading and the ROW would be cleared of vegetation, as necessary, within construction limits to complete the construction grading. Fill material and ballast would be brought in to develop the railroad embankment.

TABLE 4.5-4. ACRES OF SOIL DISTURBANCE FOR RAIL FACILITIES

PROJECT ELEMENTS	ACRES OF SOIL RESOURCES		
	DISTURBED	TEMPORARILY DISTURBED/ RECLAIMED	PERMANENTLY DISTURBED
Rail Lead to South Plant Site	55	19	36
Alternative Rail Line to South Plant Site (assumes water supply line included)	2,963	511	2,452

With implementation of growth medium salvage and reuse practices, soil conservation measures, BMPs, and other proposed operating procedures, the impacts to soil resources on reclaimed areas for the rail lead or the Alternative Rail Line would be site-specific, temporary, and moderate. Unreclaimed acres that remain would be permanently disturbed and taken out of productivity.

Operations, Maintenance, and Abandonment

Periodic maintenance of the rail lead or the Alternative Rail Line would temporarily affect the existing soil resources, although these effects would be short-term and negligible.

4.5.2.8 Mitigation

1. Ensure that soils are hauled and there is placement of growth medium to sites ready for immediate reclamation to minimize the need for stockpiling the material. The underlying subsoil material will remain in place or be disposed elsewhere.

2. Design access roads to fit the terrain by avoiding unstable slopes and highly erodible conditions to the extent practicable to protect soils and prevent excessive sedimentation. These protective measures include, but are not limited to, mulch, matting, or slope length shortening (State of Nevada 1994).

3. When soils are wet, construction, operation, and maintenance activities are to be restricted so as to properly support construction or maintenance equipment (i.e., when heavy equipment creates ruts in excess of 4 inches deep over a distance of 100 feet or more in wet or saturated soils). This standard will not apply in areas with silty soils, which easily form depressions even in dry weather. Where the soil is deemed too wet, one or more of the following measures will apply:

   - Re-route all construction or maintenance activities around the wet areas so long as the route does not cross into sensitive resource areas.

   - If wet areas cannot be avoided, implement BMPs for use in these areas during construction and improvement of access roads, and their subsequent reclamation. This includes use of wide-track or balloon-tire vehicles and equipment, or other weight dispersing systems approved by the appropriate resource agencies. It also may include use of geotextile cushions, pre-fabricated equipment pads, and other materials to minimize damage to the substrate where determined necessary by resource specialists.

   - Limit access of construction equipment to the minimum amount feasible, remove and separate topsoil in wet or saturated areas and stabilize subsurface soils with a combination of one or more of the following: grading to dewater problem areas, utilize weight dispersion mats, and maintain erosion control measures

such as surface filling and back-dragging. After construction is complete, re-grade and re-contour the area, replace topsoil, and reseed to achieve the required plant densities.

4. Vegetation is to be cleared and the construction ROW is to be graded only to the extent necessary. Vegetation within the ROW is to be cut or scraped at or near the ground level. Except for the area to be excavated, the vegetative root system and subsurface soils will be left intact to the greatest extent practicable. This will help stabilize the soils within the ROW during construction. ROW boundaries will be clearly staked or flagged and no disturbance would be allowed beyond the limits.

4.5.2.9 Unavoidable Adverse Impacts on Soils

Native soil conditions on disturbed areas would be lost due to the breakdown of soil structure, adverse effects to microorganisms, and discontinuation of natural soil development. Emission impacts to soil chemistry would be unavoidable and adverse.

4.5.2.10 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources includes the disturbance of soil resources with implementation of any alternative except the No Action Alternative. Numerous acres of soil resources would be disturbed with implementation of the Proposed Action or Action Alternatives. The permanent disturbances associated with the unreclaimed plant site and the unreclaimed portions of the ROWs for the water supply, electric transmission, and rail facilities would produce an irreversible commitment of soil resources disturbed by these features.

An irretrievable commitment of soils salvaged and utilized in reclamation would initially demonstrate a decrease in infiltration and percolation rates, decrease in available water holding capacity, and loss of organic matter. These effects would slowly be restored by natural soil development processes.

4.5.2.11 Relationship of Short-term Uses and Long-term Productivity

The use of the project area for transportation of coal, development of water facilities, and the generation and transmission of electricity would provide economic support for the rural local economies of eastern Nevada. Reclamation of the temporarily disturbed areas would return these soils to long-term productivity by being utilized as growth medium in reseeded areas, while unreclaimed areas would be permanently eliminated from potential production.

Short-term uses and long-term productivity potential for soil resources would be similar with implementation of the Proposed Action or Action Alternatives. Implementation of the No Action Alternative would not change the short-term uses or the long-term productivity of soil resources in the project area.

4.5.3 North Plant Site Alternative

Potential impacts to soil resources would be similar for the Proposed Action and all Action Alternatives. The general construction activities and impacts to soil resources with implementation of the North Plant Site Alternative would be the same as those for the Proposed Action, with variations in location (soil types) and acreages.

4.5.3.1 Direct and Indirect Effects on Soils from Plant Site

Construction

Implementation of this alternative would result in approximately 3,122 acres of soil disturbance from the construction of the North Plant Site and associated worker village. Soil resource impacts from the Mt. Wheeler Transmission Line would essentially be the same as described for the Proposed Action, thus impacts are not listed again. **Table 4.5-5** shows a breakdown of the disturbance areas.

TABLE 4.5-5. ACRES OF SOIL DISTURBANCE FOR THE NORTH PLANT SITE

PROJECT ELEMENTS	ACRES OF SOIL RESOURCES		
	DISTURBED	TEMPORARILY DISTURBED/ RECLAIMED	PERMANENTLY DISTURBED
North Plant Site Disposal Area ROW	2,479 493	0 0	2,479 493
Associated Worker Village	150	150	0
TOTAL	**3,122**	**150**	**2,972**

With implementation of growth medium salvage and reuse practices, soil conservation measures, BMPs, and other proposed operating procedures, the impacts to the 150 acres of reclaimed soils under the North Plant Site Alternative would be site-specific, temporary, and moderate. The remaining 2,972 acres would remain unreclaimed and would be permanently disturbed and taken out of productivity.

Operations, Maintenance, and Abandonment

Impacts to soil resources for the North Plant Site would be similar to those described in **Section 4.5.2.1**, although location (soil types) and acreage impacts would be different.

4.5.3.2 Direct and Indirect Effects on Soils from Electric Transmission Facilities

Construction

The electric transmission facilities impacts for the North Plant Site Alternative would be similar to the Proposed Action, except the transmission lines would extend to the North Plant Site and implementation of this alternative would require additional disturbances to soil resources as the North Plant Site Alternative is located approximately 26 miles north. **Table 4.5-6** shows a breakdown of the disturbance areas.

TABLE 4.5-6. ACRES OF SOIL DISTURBANCE FOR THE NORTH PLANT SITE ELECTRIC TRANSMISSION FACILITIES

PROJECT ELEMENTS	ACRES OF SOIL RESOURCES		
	DISTURBED	TEMPORARILY DISTURBED/ RECLAIMED	PERMANENTLY DISTURBED
Segment 1A (Lines 1 & 2) – Alt.	420	406	14
Segment 1B (Lines 1 & 2)	428	410	18
Segment 1C (Lines 1 & 2)	332	312	20
Segment 1D (Lines 1 & 2)	682	558	124
Segment 1E (Lines 1 & 2)	14	8	6
Segment 6A (Lines 1 & 2)	14	8	6
Segment 6C (Lines 1 & 2)	4,056	3,490	566
Segment 8 (Lines 1 & 2)	1,548	1,492	56
Segment 9A (Line 1)	128	96	32
Segment 9A (Lines 1 & 2) – Alt.	256	192	64
Segment 9B (Lines 1 & 2)	336	326	10
Segment 9B (Line 1) - Alt	168	163	5
Segment 9C (Line 2)	115	91	24
Segment 9D (Lines 1 & 2)	610	530	80
Segment 9D (Line 1) - Alt	555	527	28
Segment 10 (Line 2) – Alt.	657	572	85
Segment 11 (Lines 1 & 2)	1,110	1,054	56
Robinson Summit Substation, includes 50-foot wide access road	SAME AS PROPOSED ACTION – SOUTH PLANT SITE		
Harry Allen Substation Expansion			

After transmission line construction, all work areas identified as temporary disturbance on the structure location drawings would be reclaimed and salvaged topsoil would be respread during reclamation. No new off-site borrow areas would need to be developed specifically for construction of the transmission lines.

With implementation of growth medium salvage and reuse practices, soil conservation measures, BMPs, and other proposed operating procedures, the impacts to the temporarily disturbed acres of this resource would be site-specific, temporary, and moderate. The remaining acres would remain unreclaimed and would be permanently disturbed and taken out of productivity.

Operations, Maintenance, and Abandonment

Impacts to soil resources for the North Plant Site electric transmission facilities would be similar to those described in **Section 4.5.2.2**, although location (soil types) and acreage impacts would be different.

4.5.3.3 Direct and Indirect Effects on Soils from Water Supply Facilities

Construction

Impacts resulting from the water supply alternatives would be similar to the Proposed Action, except the waterlines would be different lengths and disturbed areas would be different. **Table 4.5-7** shows the disturbance areas that would result with each well field alternative.

TABLE 4.5-7. ACRES OF SOIL DISTURBANCE FOR THE NORTH PLANT SITE WATER SUPPLY FACILITIES

PROJECT ELEMENTS	ACRES OF SOIL RESOURCES		
	DISTURBED	TEMPORARILY DISTURBED/ RECLAIMED	PERMANENTLY DISTURBED
Lages Station Water Supply Line	373	255	118
Water Supply – Alternative Reduced Lages w/Coyote Valley Ranch	1,264	873	391
Water Supply – Alternative Middle Well Field	362	253	109
Water Supply – Alternative South Well Field	789	552	237
Water Supply – Alternative North Well Field	171	120	51

With implementation of growth medium salvage and reuse practices, soil conservation measures, BMPs, and other proposed operating procedures, the impacts of reclaimed soils under the North Plant Site water supply facilities would be site-specific, temporary, and moderate. The soil resources that would remain unreclaimed would be permanently disturbed and taken out of productivity.

Operations, Maintenance, and Abandonment

Impacts to soil resources for water supply facilities for the North Plant Site would be similar to those described in **Section 4.5.2.3**, although location (soil types) and acreage impacts would be different.

4.5.3.4 Direct and Indirect Effects on Soils from Rail Facilities

Construction

The types of soil impacts from the rail lead and the Alternative Rail Line for the North Plant Site Alternative would be similar to those described for the Proposed Action, although location (soil types) and acreage impacts would be different. **Table 4.5-8** shows the disturbance acreages associated with implementation of either the rail lead or the Alternative Rail Line to the North Plant Site. The rail lead to the North Plant Site would result in approximately 150 acres of new disturbance compared to the rail lead to the South Plant Site.

TABLE 4.5-8. ACRES OF SOIL DISTURBANCE FOR THE NORTH PLANT SITE RAIL FACILITIES

PROJECT ELEMENTS	ACRES OF SOIL RESOURCES		
	DISTURBED	TEMPORARILY DISTURBED/ RECLAIMED	PERMANENTLY DISTURBED
Rail Lead to North Plant Site	205	68	137
Alternative Rail Line to North Plant Site (assumes 300 water supply pipeline included)	1,694	108	1,586

As listed in **Table 4.5-8**, the impacts to the 68 acres for the rail lead and 108 acres for the Alternative Rail Line of reclaimed soils under the North Plant Site Alternative would be site-specific, temporary, and moderate. The remaining 137 and 1,586 acres, for the rail lead and

Alternative Rail Line, respectively would remain unreclaimed and would be permanently disturbed and taken out of productivity for the long-term.

Operations, Maintenance, and Abandonment

Impacts to soil resources for the North Plant Site rail facilities would be similar to those described in **Section 4.5.2.4**, although location (soil types) and acreage impacts would be different.

4.5.3.5 Mitigation

Mitigation measures necessary with implementation of the North Plant Site Alternative would be similar to those identified in the Proposed Action South Plant Site.

4.5.3.6 Unavoidable Adverse Impacts on Soils

The unavoidable adverse physical impacts to soil resources would be similar to those identified in the Proposed Action (**Section 4.5.2.6**).

4.5.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources includes the disturbance of soil resources with implementation of any alternative except the No Action Alternative. Numerous acres of soil resources would be disturbed with implementation of the North Plant Site Alternative or Action Alternatives. The permanent disturbances associated with the unreclaimed plant site and the unreclaimed portions of the ROWs for the water supply, electric transmission, and rail facilities would produce an irreversible commitment of soil resources disturbed by these features.

An irretrievable commitment of soils salvaged and utilized in reclamation would initially demonstrate a decrease in infiltration and percolation rates, decrease in available water holding capacity, and loss of organic matter. These effects would slowly be restored by natural soil development processes.

4.5.3.8 Relationship of Short-term Uses and Long-term Productivity

Short-term use and long-term productivity would be similar to the Proposed Action (**Section 4.5.2.8**).

4.5.4 No Action Alternative

Under the No Action Alternative, the Proposed Action and all alternatives would not be approved. Local effects to soil resources from the construction of these facilities would be eliminated.

4.6 Air Resources

4.6.1 Indicators and Methods

Air quality impacts associated with the project are assessed for the construction and operational phase. The primary indicators of air quality impacts will be the multiple ambient impact standards documented in **Section 3.6.2** that define ambient air quality, incremental degradation of air quality, and air quality related values (AQRVs) including visibility. Studies of potential fog formation and dispersion of emission under inversion conditions are also included. Indicators include:

- Emissions in tons per year for each type of regulated pollutant
- Modeled dispersion and concentrations of pollutants

- Compliance with NAAQS, applicable PSD increment limits, and BLM AQRV impact thresholds developed in consultation with federal land managers in Class I areas and FLM-indicated sensitive Class II areas
- Amount and timeframe of steam/water vapor emitted from project operations
- Average annual days with temperatures conducive to creating fog and inversions
- Distance to Class I areas

The quantitative analyses of operational air quality impacts from all operations at the proposed EEC follow requirements in the Federal New Source Review (NSR) and Prevention of Significant Deterioration (PSD) air quality permitting programs, and programs established by the Nevada Department of Environmental Protection (NDEP) to implement those requirements in Nevada. Federal Land Managers (FLMs) participated in the process by defining sensitive Class II areas where AQRV impact analyses were requested, as well as recommending AQRV analyses at the two Class I areas within 300 km from the proposed facility.

The facility's air permit application to NDEP was prepared consistent with a NDEP-approved modeling protocol that included the EEC at the proposed location, and assumed that the proposed LS Power White Pine Energy Station would operate at proposed rates. The air dispersion analyses were performed utilizing the EPA-approved models deemed most appropriate by NDEP, with input from regional FLMs. The model AERMOD was used for the near-field (for impact projections at all areas within 50 kilometers of the proposed energy center sites) and the model CALPUFF was used for long range transport analyses (impact projections in all areas beyond 50 kilometers from the proposed energy center sites, including out to 300 kilometers for the two Class I areas). For this EIS, that NDEP-approved analysis methodology was used to prepare impact analyses for each of the EEC plant site alternatives and the output of the analyses were interpreted to assess impacts of the Proposed Action with and without the reasonably foreseeable LS Power White Pine Energy Station project.

The initial ambient air quality impact assessments for the near-field were prepared using six months of onsite meteorological data collected by the Proponents, and also with five years of meteorological data from the National Weather Service station at Ely's Yelland Field airport. The initial near-field impact analyses using on-site meteorological data prepared for the South Plant Site were updated in late 2007 after a full year's data collection was completed in September, 2007. Those minimally changed near-field impact analyses were reported in the current permit application and are included in this EIS. CALPUFF long-range transport analyses utilized detailed meteorological data prepared from regional meteorological data using sources including all National Weather Service observation stations and local terrain features using the model MM5. The NDEP air permit application did not address air pollutant emissions from construction or project components located outside the EEC plant site. This EIS analysis does consider construction and operational air quality impacts associated with all project components both on- and off-site. Virtually all project components would have at least minor and temporary construction impacts. The only project component outside the plant site expected to have the potential for any significant contribution to ambient air quality is the locomotive emissions on the rail line transporting coal from Shafter to the plant site.

In Class I areas, impacts to soil and vegetation due to mode-predicted deposition of airborne nitrogen and sulfate in the form of multiple compounds containing those elements are compared against the against the BLM threshold of 3 kg nitrogen and 5 kg sulfur per hectare per year. National Park Service research in Great Basin National Park, consistent with Federal Land-

Managers Air Group (FLAG) guidance for determining critical load that indicates acid sensitive soils and high mountain lake ecosystems, is documented.

Potential visibility degradation associated with the Proposed Action in Class I and Class II areas was estimated using the recently proposed revision to the FLAG screening recommendations during the April 2006 specialty conference *Guideline on Air Quality Models: Application and FLAG Developments* (Vimont 2006) utilizing CALPUFF Method 6 visibility post processing. This method was employed in the recent Western Regional Air Partnership (WRAP) effort to model major air pollution sources in the western U.S. and require Best Available Retrofit Technology (BART) at all facilities shown to have excess impacts. The approach uses post-processed modeled data from long-range transport models to estimate light extinction as a function of the particulate concentrations. **Appendix 4A** also includes the results of a parallel screening visibility impact analysis consistent with the 2001 FLAG guidance utilizing the CALPUFF Method 2 post processing methodology.

The Method 6 visibility screening analysis applies a three-tiered approach to assess the significance of visibility impacts on Class I areas (**Figure 4.6-1**) using the EPA-approved long range transport model CALPUFF consistent with methodologies described in the 1998 Interagency Workgroup on Air Quality Modeling (IWAQM) guidelines to assess particulate, nitrate and sulfate transport, then interpreting the visibility implications of those concentrations using CALPOST Method 6. The FLAG Tier 1 screening analysis adds predicted facility contributions to background conditions based on the best 20 percent of days of visibility at the impacted site, and estimates likely visibility degradation on some of the clearest days observed there measured as increases in light extinction Δb_{ext}. The value b_{ext} is a measure of the concentration of materials in the air that scatter light. Higher Δb_{ext} values, or increases in light extinction, would mean that more light is scattered, so less light passes through, and as a result visibility through the air is decreased. The FLAG Tier 2 screening analysis uses the same methods except that predicted facility contributions are added to the background conditions based upon average visibility days. The FLAG recommended thresholds for air permitting for each tier analysis for facilities with the level of emission controls proposed are a qualitative comparison with few if any increases of five percent increase in Δb_{ext} on clear days, and none reaching a ten percent increase. A five percent change in b_{ext} represents the threshold at which a person would notice a visibility change. The proposed FLAG guidance includes more detailed analyses that could allow for FLMs to recommend approval for proposed actions that do not pass Tier 1 or 2 screening visibility analyses. The visibility analysis consistent with historic FLAG guidance utilizing CALPUFF Method 2 employed similar methodology. Practically, the Method 2 option is more inclined to identify visibility impacts during to weather events, so is more prone to predicting visibility degradation in conditions where natural conditions already limit visibility.

In the vicinity of the Proposed Action, direct impacts are documented consistent with the requirements of the PSD permitting process as set by the state of Nevada for the four criteria pollutants modeled (CO, SO_2, NO_2, and PM_{10}) and Air Quality Related Values (AQRVs). That process defined the maximum extent of impacts representing significant contributions to ambient air quality levels for criteria air pollutants in Class II areas, and also included analyses of criteria pollutant and AQRV impacts at the two Class I areas within 300 kilometers (Jarbidge Wilderness and Zion National Park), and the two FLM-identified sensitive Class II areas within 100 kilometers (Great Basin National Park and Ruby Lake National Wildlife Refuge). Those areas where modeling predicted significant contributions for the proposed EEC are defined in **Section 4.6.2** for the South Plant Site, and in **Section 4.6.3** for the North Plant Site Alternative. The extent of those areas of significant contribution was confirmed to be less than 46 kilometers of each plant site by modeling performed to support the application for the facility's operating

permit to construct prepared for review by the NDEP consistent with NDEP and EPA guidance. Also included is an analysis of human and ecological risks within 50 kilometers of the proposed EEC associated with the air emissions from operation of the EEC. Air pollutant emissions and predicted maximum ambient air quality impacts are summarized in this section. They are covered in more detail with supporting documentation in **Appendix 4A**.

4.6.2 Proposed Action: South Plant Site

The near field direct impact area included all Class II areas where the air permit modeling showed the potential for significant contributions to air quality from the proposed EEC. Significant contribution is a quantitatively defined EPA term. EPA significant contribution levels are documented in **Table 3.6-1**. Those significant contribution areas extended up to 43.8 kilometers (27.2 miles) from the proposed plant site.

The area in which potential EEC air quality impacts predicted by air dispersion models reached or exceeded air permitting significant contribution levels for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter less than 10 microns in diameter (PM_{10}) are shown in **Figures 4.6-1** and **4.6-2**. The maximum significant contribution radius in **Figure 4.6-2** is equal to the distance to the furthest point at which significant contributions are predicted.

4.6.2.1 Direct and Indirect Effects on Air Quality from Plant Site

Construction

Construction impacts are anticipated to include moderate dust generation that could potentially result in significant contributions to ambient air quality in the near vicinity of the plant site and its access roads. At a PM_{10} emission factor of 0.11 ton/acre/month, the total PM_{10} emissions are estimated to be 1,980 tons during plant construction. Based on a 60-month construction time schedule, the total plant construction vehicle and equipment tailpipe emissions were estimated to be 187 tons of VOC, 1,033 tons of CO, 3,530 tons of NO_x, 171 tons of PM_{10}, and 3.1 tons of SO_2. The maximum 60-month PM_{10} fugitive emissions resulting from employees commuting over unpaved roads were estimated to be 67.6 tons. Portable concrete batch plants are expected for plant construction; the PM_{10} emissions from these sources are estimated to be 23 tons per year. Elsewhere, construction impacts are expected to be insignificant. Further details of these impact assessments are included in **Appendix 4A**.

Operations, Maintenance, and Abandonment

Emissions

Criteria Air Pollutants

Criteria air pollutant emission rates were obtained from Table 4.1 of the Class I Application Review prepared by the State of Nevada BAPC (October 2007). **Table 4.6-1** provides a summary of the EEC's facility-wide potential to emit (PTE) criteria air pollutants. The summary includes all onsite operational emissions, including those from coal trains on site. It does not include commuter vehicles and some onsite vehicular traffic not related to production.

These PTE rates qualify the facility as a major source, as defined under Federal New Source Review and PSD regulations (40 CFR 52.21), for PM_{10}, NO_2, SO_2, and CO. Therefore, the air permit application must verify emission controls would meet Best Available Control Technology (BACT) requirements, and demonstrate compliance with ambient air quality impact limits for criteria air pollutants. The air quality impact analyses and their results are discussed below under Ambient Air Quality Impacts.

TABLE 4.6-1. FACILITY-WIDE STATIONARY SOURCE POTENTIAL TO EMIT

POLLUTANT	POTENTIAL TO EMIT (POUNDS/HOUR)	POTENTIAL TO EMIT (TONS/YEAR)
Total Particulate Matter (PM)	449	1,788
Particulates as PM_{10}	449	1,788
Sulfur Dioxide	3,311	4,628
Carbon Monoxide	1,758	7,720
Oxides of Nitrogen	1,166	4,853
Volatile Organic Compounds	67	285
Lead	0.5	2.0

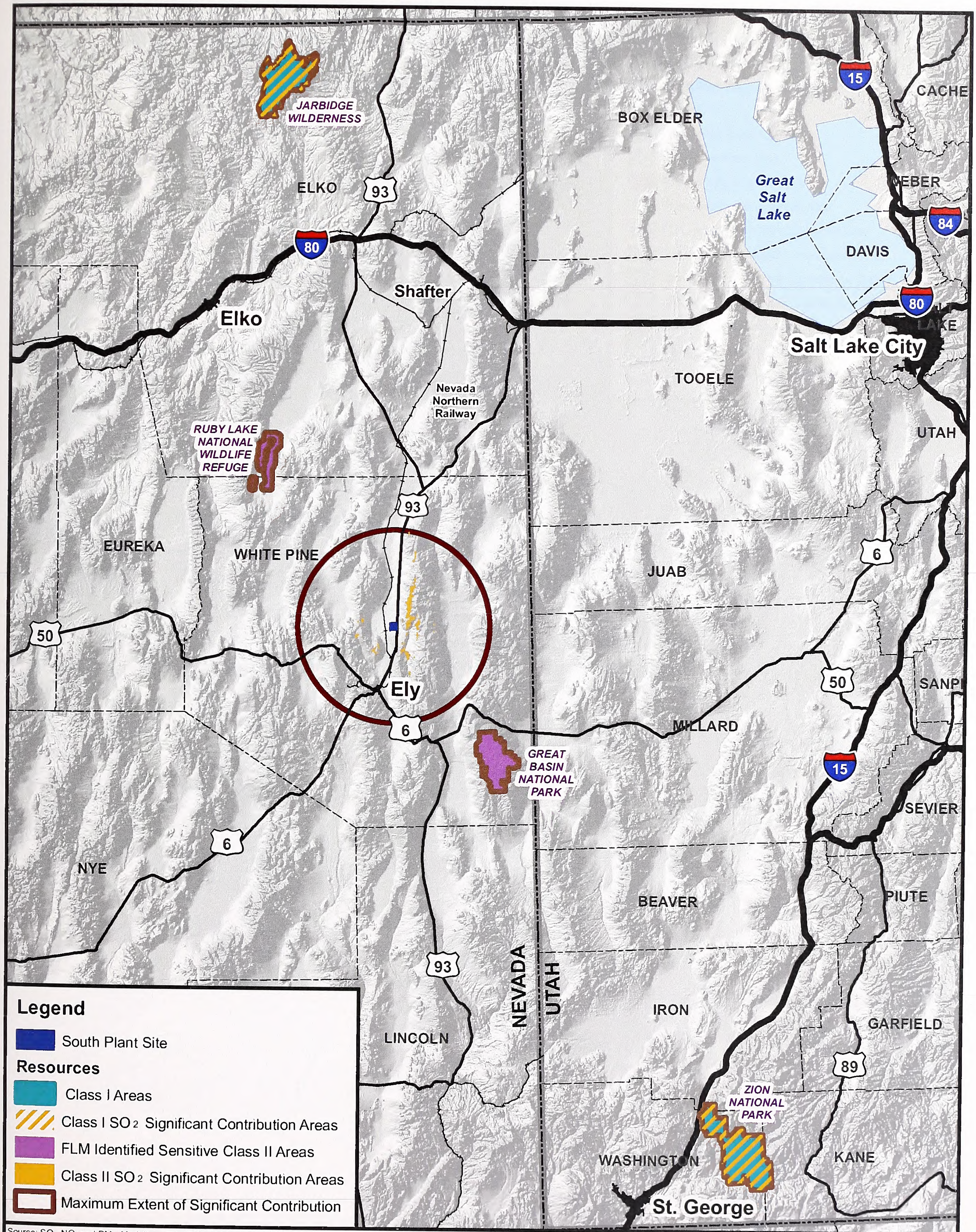
Because the EEC is a major source subject to the PSD requirements, the facility is required to undergo a BACT analysis. BACT involves identifying all potential control technologies applicable to the pollutant and process; determining the technical feasibility of each control technology identified as applicable to the proposed facility; ranking the remaining control technologies based on achievable emission rates; and evaluating the most effective control technology based on economic, energy, and environmental factors. The final step in a BACT analysis is selecting a BACT and corresponding emission limit for the pollutant.

BACT for the EEC is based on a two-unit, pulverized coal-fired (PC) plant using a supercritical cycle designed to fire on western subbituminous coal. Each unit would be rated at 750 MW nominal generating capacity. (BACT was also performed on ancillary plant equipment, but this will not be discussed here as they are not the primary emission source; please refer to the permit application). The EEC would be equipped with a continuous emissions monitoring system (CEMS) that would monitor and record pollutants as required under federal and state regulations.

Emissions for NO_x, SO_2, sulfuric acid (H_2SO_4), CO, VOC, PM, lead, and hydrogen fluoride (HF) are subject to a BACT analysis. Emissions of pollutants that could lead to acid deposition, visibility degradation, and ozone formation are reduced by BACT control, and in addition are regulated by the 40 CFR Part 60 New Source Performance Standards and 40 CFR Part 75 Acid Rain Program.

BACT requires thorough analysis of potential emission control. Several feasible control systems were considered before BACT was selected. The options for BACT, with emission control efficiency and cost effectiveness (in terms of annual cost per ton removed) are shown in **Table 4.6-2**.

The most efficient controls, and where applicable the most expensive annual cost per ton removed option, were selected as BACT for each pollutant. For the main pulverized coal (PC) boilers, BACT was determined to be selective catalytic reduction (SCR) with low NO_x burners (LNB) and over fire air (OFA) for NO_x control, wet flue gas desulphurization (FGD) for SO_2 control, fabric filter system for PM_{10} and lead control, and good combustion practices for CO and VOC control. H_2SO_4 and HF BACT are based on PM and SO_2 control because that combination of control technologies would meet the proposed emission limits.



Source: SO_2, NO_2 and PM_{10} Modeling: TetraTech 2008
Base Map: National Atlas of the United States

1:2,400,000

20 0 40 Miles

20 0 80 Kilometers

Scale is 1:2,400,000 when printed at 8.5"x11"

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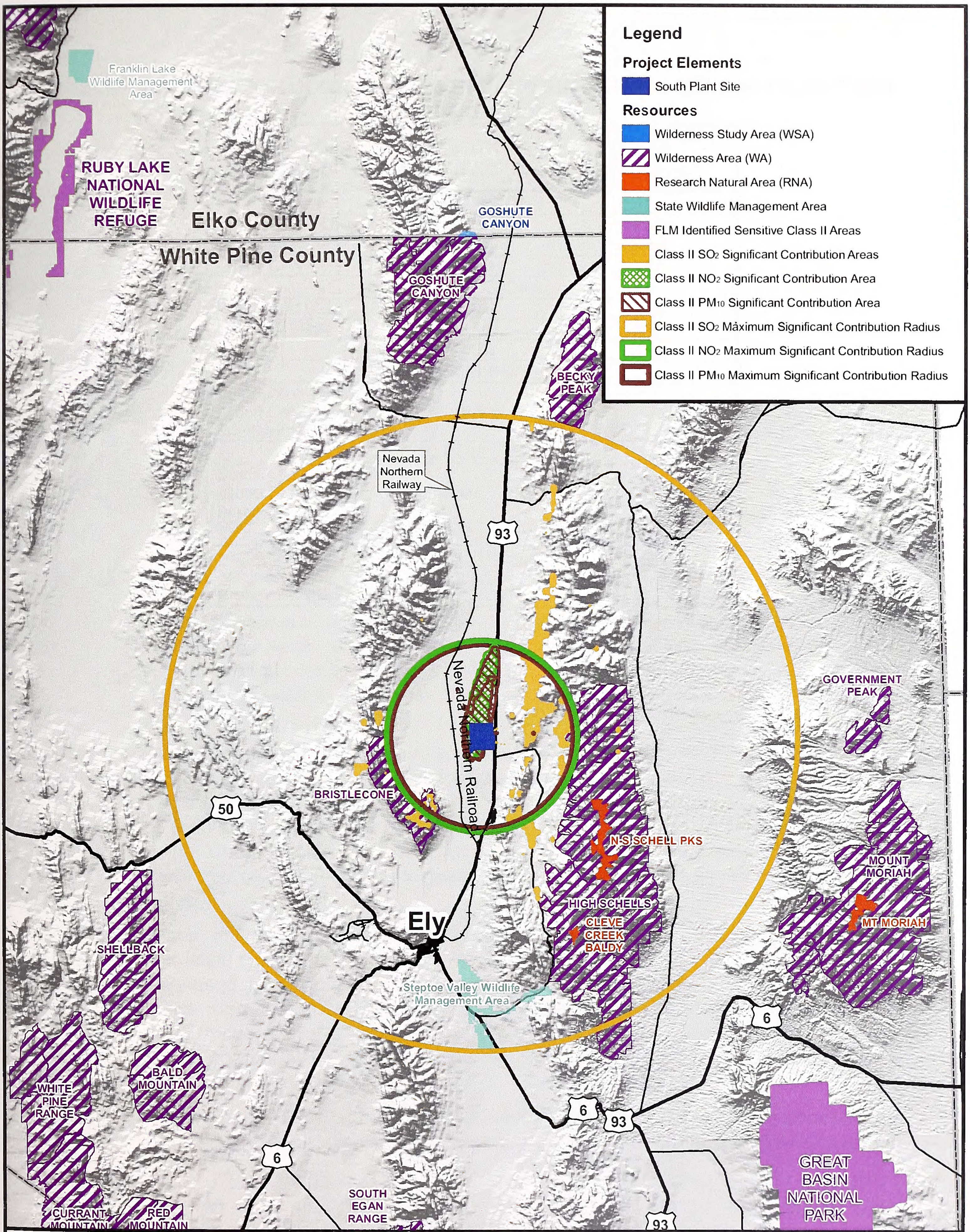
FIGURE 4.6-1
DIRECT IMPACT AREA FOR
PROPOSED ACTION AIR QUALITY ANALYSIS
ELY ENERGY CENTER



Source: SO_2, NO_2 and PM_{10} Modeling: TetraTech 2008; WA and WSA; Bureau of Land Management; WA and RMA: U.S. Forest Service
Base Map: University of Nevada, Reno and ESRI

1:720,000
5 0 10 Miles
2,0000 18,000 Meters
Scale is 1:720,000 when printed at 8.5"x11"

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FIGURE 4.6-2
CLASS II DIRECT IMPACTS FOR
PROPOSED ACTION AIR QUALITY ANALYSIS
ELY ENERGY CENTER

TABLE 4.6-2. EMISSION CONTROL OPTIONS AND EFFECTIVENESS FOR PULVERIZED COAL BOILER

CONTROL TECHNOLOGY	CONTROL EFFICIENCY (%)	TOTAL ANNUAL COST PER TON REMOVED
NOx EMISSIONS		
SCR + LNB + OFA	87.0%	$2,208
SNCR + LNB + OFA	63.1%	$966
LNB + OFA	52.2%	$52
SO_2 EMISSIONS		
LSFO (Wet FGD)	97.0%	$1,067
LSD (Dry FGD)	95.4%	$918
(DSI)	49.3%	$397
CO EMISSIONS		
Combustion Controls (Good Combustion Practices)	NA	NA
VOC EMISSIONS		
Combustion Controls (Good Combustion Practices)	NA	NA
PM EMISSIONS (AND LEAD)		
Fabric Filter	99.91%	$64
Electrostatic Precipitator (ESP)	99.86%	$50

SCR = Selective catalytic reduction
SNCR = Selective non-catalytic reduction
OFA = Over fire air
DSI = Dry sorbent injection
FGD = Flue gas desulfurization
LSD = Lime spray dry absorber
LSFO = Limestone forced oxidation
LNB = Low NOx Burners

The permit application stated that mercury emissions would be controlled under the Clean Air Mercury Rule (CAMR) as implemented in Nevada. However, on February 8, 2008, the D.C. Circuit Court vacated EPA's rule removing power plants from the Clean Air Act list of sources of hazardous air pollutants. At the same time, the Court vacated the Clean Air Mercury Rule. EPA is reviewing the Court's decisions and evaluating its impacts. However, the Proponents' selection of activated carbon injection as mercury control remains unchanged even though the CAMR is vacated.

Activated carbon injection is considered "mercury specific control" as opposed to being controlled by existing control for pollutants such as NOx, SO_2, and PM. According to EPA, the control is widely used in municipal waste combustors and medical waste incinerators in the US and Europe. Activated carbon injection involves powdered activated carbon (PAC) sorbent that is injected into the flue gas at a location in the duct preceding the particulate matter control device. The PAC sorbent binds with the mercury in the flue gas in the duct and is collected in the particulate matter control device.

Table 4.6-3 shows the PTE by process at the plant site with the BACT emission controls from Table 4.2 of the Class I Application Review prepared by the State of Nevada (BAPC, October 2007).

TABLE 4.6-3. POTENTIAL TO EMIT POLLUTANTS (TONS/YEAR) BY PROCESS AT THE PLANT SITE

COMPONENTS	CO	NO_X	SO_2	PM	PM_{10}	VOC
Boilers	7630	4580	4580	1530	1530	267
Auxiliary Boiler	34.7	96.4	48.2	19.3	19.3	1.73
DIESEL Generators	0.89	0.69	0.0024	0.08	0.72	0.07
Fire Water Pumps	0.56	0.91	0.0004	0.033	0.033	0.13
Switchyard Diesel ENGINE	0.72	1.2	0.0005	0.04	0.04	0.17
diesel so_2 absorber quench pump	0.49	0.49	0.0003	0.03	0.03	0.07
booster fire water pump	0.09	0.08	0.00005	0.007	0.007	0.01
propane auxiliary generator	0.06	0.09	0.03	0.01	0.01	0.01
Material Handling	-	-	-	145	145	-
Locomotives	51.0	171.5	2.0	10.4	10.4	12.7
Cooling Tower	-	-	-	51.8	54.8	-
Storage Tank	-	-	-	-	-	2.07

HAPs

A substance is designated as a hazardous air pollutant (HAP) by regulation of the Nevada State Environmental Commission, adopted by reference from the EPA list in 42 U.S.C. 7412(b). Emission rates for each 39 organic and 13 inorganic HAPs are documented in **Appendix 4A**. Mercury emissions were estimated to be 0.15 TPY. The HAP emission levels would qualify the EEC as a major source of HAPs under Federal New Source Review regulations, requiring Maximum Available Control Technology (MACT) for HAPs at the facility's energy production boilers. Emission controls to meet MACT requirements are the same as those used for criteria emission control and are discussed above under criteria air pollutant BACT controls. Activated carbon injection would be used for mercury control.

Employee Commuter Emissions

The annual tailpipe emissions from employees commuting to the EEC were estimated to be 0.14 tons of VOC, 1.5 tons of CO, 0.1 tons of NOx, 0.003 tons of PM_{10}, and 0.002 tons of SO_2. The maximum annual PM_{10} fugitive emissions resulting from employees commuting were estimated to be 22 tons/year.

CO_2 and other Greenhouse Gas Emissions

Carbon dioxide, methane and nitrous oxides are currently not regulated air pollutants, but are likely to contribute to overall global climatic changes. Carbon dioxide (CO_2) emissions from the EEC project are estimated to be 10.57 million tons/year. The greenhouse gases of methane (CH_4) and nitrous oxide (N_2O) contribute the equivalent CO_2 emissions, or CO_2(e)/year, of 2,400 tons CO_2(e)/year and 26,192 tons CO_2(e)/year, respectively. Therefore, total CO_2(e) emissions would be 10.6 million tons/year (Sierra Pacific Resources 2007).

Abandonment

EEC abandonment, in the future would result in short duration emissions during the demolition and site closure process that could briefly represent significant contributions to particulate and engine exhaust air pollutant levels within the plant site and near the plant boundary, but would

be minor beyond a few hundred yards of the plant boundary including at all identified areas of regular human activity.

Ambient Air Quality Impacts

Class I Area and FLM Identified Sensitive Class II Area Impacts

Air quality modeling analyses verified by NDEP showed that maximum NO_2 and PM_{10} impacts predicted in the two Class I areas evaluated and maximum predicted impacts for all three pollutants at the FLM-identified sensitive Class II areas were below the PSD significant contribution thresholds (the PSD Class SILs). SO_2 impacts from the Proposed Action were determined by NDEP to exceed the Class I significant contribution threshold, the threshold above which cumulative incremental degradation analyses are required, but to not approach the PSD limit for incremental degradation in SO_2 concentrations. The cumulative PSD analysis of incremental degradation in SO_2 air quality levels is included in **Section 5.6**.

Class II Area Impacts

Shaded areas in **Figures 4.6-1** and **4.6-2** show the areas where maximum air quality impacts exceeding Class II SILs are predicted for NO_2, SO_2, and PM_{10}, respectively. Class II SILs for CO are not predicted to be exceeded.

The maximum impacts predicted from South Plant Site are quantified in **Table 4.6-4**. That table shows that plant site operational impacts would not exceed federal and state limits for incremental degradation, and that facility impacts combined with measured background concentrations would not approach national or Nevada ambient air quality standards.

TABLE 4.6-4. AIR QUALITY MODELING PREDICTED MAXIMUM: SOUTH PLANT SITE

POLLUTANT	AVER. PERIOD	EEC MET. DATA MAXIMUM MODELED CONC. (μG/M³)(A)	ELY YELLAND FIELD MET. DATA MAXIMUM MODELED CONC. (μG/M³)(A)	BACKGR. CONCS. MEAS. ONSITE (μG/M³)	TOTAL CONCS EEC MET. DATA IMPACT PLUS BACKGR. (μG/M³)	DISTANCE AND ORIENTATION OF MAXIMUM IMPACT LOCATION FROM PROPOSED BOILER STACKS	PSD INCR. LIMIT IN CLASS II AREAS	NAAQS AND NEVADA AAQS (μG/M³)
NO_2	Annual	5.2	3.3	3.7	8.9	1.4 miles NNW	25	100
PM_{10}	24 hours	31.9	20.9	19.0	50.9	1.3 miles NNW	30	150
	Annual	9.4	3.7	7.0	16.4	1.3 miles N	17	50
SO_2	3 hours	176	311	4.0	180.0	4.5 miles SE	512	1300
	24 hours	34.0	12.5	3.0	37.0	4.5 miles ESE	91	365
	Annual	6.9	0.66	3.0	9.9	12.9 miles NNE	20	80
CO	1 hour	457	478	2415	2862	4.5 miles ENE	NA	40000
	8 hours	64.9	61.7	2358	2423	0.9 miles ESE	NA	10000

[A] The NO_x to NO_2 conversion factor of 0.75 is applied

Visibility / Regional Haze

Quantitative estimates of Δb_{ext} were prepared to estimate visibility extinction for the two Class I areas and the two identified sensitive Class II areas selected by the FLMs, using meteorological data from the years 2002 through 2004 using the proposed FLAG methodology update utilized in a recent WRAP regional air quality modeling study featuring a tiered set of analyses using CALPUFF Method 6 post-processing, and the historic FLAG methodology featuring CALPUFF

Method 2 post-processing. NDEP concurred during their review of the facility's permit application that the visibility analyses demonstrates compliance with applicable visibility impact limits. More detail of the visibility impact analyses and NPS's comments on potential impacts to sensitive Class II areas is included in **Appendix 4A**.

An analysis was prepared for the near-field (< 50 km distance) to assess the potential for inversions to trap pollutants in Steptoe Valley (Tetra Tech 2007). Analyses indicated that the exhaust plume from the proposed plant site would be well above almost all evening inversions, and that the models used to predict dispersion of the plume in ambient air would reasonably estimate concentrations in Steptoe Valley in all vertical mixing profiles including inversions.

Another analysis was performed to assess the extent to which fog formation associated with plant site operations would cut down visibility in the vicinity, and especially along US-93 (Farstad and Hacker 2007). The model results suggest that the combination of atmospheric conditions in the area and the EEC operations would not produce any increase in fogging or icing that would be noticeable along US-93.

Deposition of Nitrates, Sulfates, and Other Compounds

The BLM recommends a threshold of 3 kilograms per hectare per year total deposition of nitrogen and 5 kilograms per hectare per year total deposition of sulfur, including background or measured deposition as well as predicted impacts of proposed future actions (Fox 1986). Comparisons of predicted deposition levels with each threshold discussed show that deposition rates are predicted to be within the recommended cumulative range across all Class I and Class II areas analyzed. More details on the deposition impact analyses and potential impacts to sensitive Class II areas is included in **Appendix 4A**.

The impact of the deposition of numerous compounds closer to the plant site was assessed through the application of a risk assessment model, which also included assessment of human and ecological risk from inhalation and all other exposure pathways.

Risk Assessment

In order to analyze the direct and indirect health effects of boiler emissions, a human health risk assessment (HHRA) and ecological risk assessment (ERA) were conducted for the South Plant Site by Tetra Tech (2008a). Cumulative health effects of the EEC combined with emissions from the WPES were also evaluated in the risk assessment and are discussed in **Section 5.6**. Risk assessments for boilers permitted under the Resource Conservation and Recovery Act (RCRA) are currently completed in accordance with guidance provided by the EPA for hazardous waste combustors. This guidance was used to conservatively conduct the HHRA and ERA for the EEC although the project would not burn hazardous waste. The EPA protocols direct that the risk assessment contain separate sections for waste characterization and emission estimates; air dispersion modeling; HHRA procedures; SLERA procedures; risk assessment results; and summary and conclusions. This section is a summary of the risk assessment HHRA/ERA findings; detailed descriptions of protocols, modeling parameters, tabular results, and conclusions can be found in Tetra Tech (2008a) in the Project Record. Details on the risk assessment methodology are included in **Appendix 4A**.

Human Health Risk Assessment Results

Total human health risks were under the excess cancer threshold of 1 in 100,000 (1×10^{-5}) for all receptors studied. Three receptors exceeded the target of 1 in 1 million (1×10^{-6}):

- subsistence adult fisherman living in an agricultural area with a risk of 3×10^{-6}

- subsistence adult farmer at maximum emission impact (MEI) location (where no farming or ranching currently occurs) with a risk of $8x10^{-6}$
- child of subsistence farmer at MEI location (where no farming or ranching currently occurs), with a risk of $2x10^{-6}$

All those risks are within the EPA acceptable range of 10^{-4} to 10^{-6}. Subsistence farmers at all locations where ranching currently exists were predicted to have excess cancer risks less than 10^{-6} (1 in 1 million). Excess cancer risks associated with emissions from the main EEC boilers were predicted to be less than 1 in 1 million. Only the conservative assumption of maximum emissions from the main boilers and simultaneous maximum production from the auxiliary boilers as well, an unlikely scenario for any duration, results in any risk greater than 1 in 1 million.

Maximum total hazards calculated were 0.68 for a subsistence farming child at the maximum emission impact location (where no subsistence farming currently occurs). The maximum acute hazard quotient (AHQ) calculated for any receptor studied was 0.084 at the plant site fence line (where there is no regular human activity). Both values are well below the recommended screening safety threshold of 1. The maximum predicted daily ADD_{infant} value of 6.8 pg/kg for an infant at the maximum exposure location (where there are no current residences) was well below the EPA recommended threshold of 93 pg/kg.

Table 4.6-5 presents the maximum media concentrations for each human health land use for arsenic, lead, and mercury (as methyl mercury and mercuric chloride), and the receptor locations at which they occurred. Media concentrations were calculated using the latest version of the "Industrial Risk Assessment Program – Human Health" (IRAP-h View) software (Tetra Tech 2008b). Site-specific baseline conditions were not employed as inputs into the media concentration calculations; rather, the media concentrations provided represent those concentrations occurring solely as a result of the Proposed Action. However, the model conservatively estimates the maximum emission scenario of all three boilers – MSK1, MSK2, and the auxiliary boiler – operating concurrently. All concentrations are significantly less than EPA-recommended thresholds (as reported in EPA's Integrated Risk Information System [IRIS]) and the Cal-Modified EPA remediation goals, where applicable.

TABLE 4.6-5. MAXIMUM MEDIA CONCENTRATIONS FOR SELECTED COPC'S ANALYZED FOR THE SOUTH PLANT SITE IN THE HHRA1

COPC	SOIL[2]	WATER[3]	AIR[4]
Arsenic	8.38×10^{-8} (MEI)	1.41×10^{-7} (McGill Spring)	2.41×10^{-4} (MEI)
Lead	1.49×10^{-4} (MEI)	1.76×10^{-7} (McGill Spring)	2.47×10^{-4} (MEI)
Methyl Mercury	6.52×10^{-5} (MEI)	1.13×10^{-9} (Duck Creek)	N/A[5]
Mercuric Chloride	2.43×10^{-3} (MEI)	2.49×10^{-8} (Duck Creek)	1.86×10^{-5} (MEI)

[1] Model receptor location where maximum concentration was observed provided in parentheses.
[2] Soil concentration due to deposition, as mg COPC/kg soil.
[3] Total water column concentration, as mg COPC/L water; except methyl mercury, reported for dissolved-phase water column concentration, as mg COPC/L water.
[4] Air concentration (chronic), as µg COPC/m³.
[5] Air concentrations for methyl mercury were not provided.
Source: Tetra Tech 2008b

The reported results are based upon the current understanding of risks, assessments of emissions from the EEC boiler emissions, and understandings of land use based upon current and potential land use patterns. They are subject to as few uncertainties as could be controlled.

Ecological Risk Assessment Results

Four terrestrial habitats (shrub-steppe, montane, Bassett Lake/shrub-steppe, and Bassett Lake/montane) and two aquatic habitats (Bassett Lake and McGill Spring) were evaluated for the South Plant Site emission sources, including operation of the two main boilers as well as the auxiliary boiler (both individually and in combination). McGill Spring is primarily used as a recreational swimming pool, and therefore ecological receptors would not be expected to use it; however, McGill Spring was evaluated as a surrogate for the numerous other springs in the assessment area because it is close to the South Plant Site.

In the shrub-steppe terrestrial habitat, HQs did not exceed 1 for any COPC in any receptor. The highest source-specific HQ value, due to emissions from the two main boilers, was presented by 2,3,7,8-TCDD (HQ = 5.8E-03) for the carnivorous mammal guild (represented by the coyote) feeding exclusively on herbivorous birds (modeled as the sage grouse). Receptor-specific HI values did not exceed 1 for the South Plant Site for all dietary scenarios. The highest HI value occurred in the omnivorous bird guild, represented by the American robin (HI = 6.0E-03).

In the montane terrestrial habitat, HQs did not exceed 1 for any COPC in any receptor. The highest source-specific HQ value, due to emissions from the two main boilers, was presented by 2,3,7,8-TCDD (HQ = 1.4E-02) for the carnivorous mammal guild (represented by the long-tailed weasel) feeding exclusively on omnivorous birds (modeled as the American robin). Receptor-specific HI values did not exceed 1 for the South Plant Site for all dietary scenarios. The highest HI value occurred in the carnivorous mammal guild, represented by the long-tailed weasel (HI = 1.0E-02).

COPC-specific HQs for the Bassett Lake/shrub-steppe receptors (birds and mammals assumed to be foraging and hunting around Bassett Lake) were also less than 1. The highest HQ value, which resulted from operation of the MSK1 boiler, was presented 2,3,7,8-TCDD (HQ = 4.3E-03) for carnivorous mammals feeding exclusively on herbivorous birds. Receptor-specific HI values did not exceed 1 for the South Plant Site for all dietary scenarios. The highest HI value occurred in the carnivorous mammal guild, represented by the coyote (HI = 3.3E-03).

COPC-specific HQs for the Bassett Lake/montane receptors were also less than 1. The highest HQ value, which resulted from the operation of the MSK1 boiler, was presented by 2,3,7,8-TCDD (HQ = 4.4E-03) for carnivorous mammals feeding exclusively on omnivorous birds (modeled as the chukar). Receptor-specific HI values did not exceed 1 for the South Plant Site for all dietary scenarios. The highest HI value occurred in the carnivorous mammal guild, represented by the coyote (HI = 3.2E-03).

In the aquatic habitat modeled as Bassett Lake, HQs did not exceed 1 for any COPC in any receptor. The highest HQ value, which resulted from emissions from the MSK2 boiler, was presented by 2,3,7,8-TCDD (HQ = 3.3E-02) for the omnivorous mammal guild (represented by the muskrat) consuming exclusively benthic invertebrates. Receptor-specific HI values did not exceed 1 for the South Plant Site for all scenarios. The highest HI value occurred in the carnivorous bird guild, represented by the red-tailed hawk (HI = 4.5E-02).

In the aquatic habitat modeled as McGill Spring, HQs did not exceed 1 for any COPC in any receptor. The highest HQ value, which resulted from emissions from both boilers, was presented by copper (HQ = 6.1E-03) for the aquatic life community. Receptor specific HI values

did not exceed 1 for the South Plant Site for all scenarios. The highest HI value occurred in the aquatic life community (HI = 6.9E-02).

Inhalation risk was also evaluated for each boiler for mammals. All of the HI values are below 1, indicating that emissions from the boilers at the South Plant Site do not present an inhalation risk to mammals (Tetra Tech 2008a). The HI value associated with ecological inhalation was 2.3E-06.

Table 4.6-6 presents the maximum media concentrations for each ecological habitat evaluated for arsenic, lead, and mercury (as methyl mercury and mercuric chloride), and the habitat receptor locations at which they occurred. Media concentrations were calculated using the method described above for the HHRA.

TABLE 4.6-6. MAXIMUM MEDIA CONCENTRATIONS FOR SELECTED COPC'S ANALYZED FOR THE SOUTH PLANT SITE IN THE SLERA[1]

COPC	SOIL[2]	WATER[3]	AIR[4]
Arsenic	1.24×10^{-8} (Montane)	1.41×10^{-7} (McGill Spring)	7.50×10^{-5} (Montane)
Lead	1.21×10^{-5} (Montane)	1.46×10^{-7} (McGill Spring)	7.69×10^{-5} (Montane)
Methyl Mercury	3.00×10^{-6} (Montane)	1.48×10^{-9} (McGill Spring)	N/A[5]
Mercuric Chloride	1.65×10^{-4} (Montane)	1.97×10^{-8} (McGill Spring)	1.23×10^{-6} (Montane)

1 Model habitat receptor location where maximum concentration observed provided in parentheses.
2 Soil concentration due to deposition, as mg COPC/kg soil.
3 Total water column concentration, as mg COPC/L water; except methyl mercury, reported for dissolved-phase water column concentration, as mg COPC/L water.
4 Air concentration (chronic), as µg COPC/m3.
5 Air concentrations for methyl mercury were not provided.
Source: Tetra Tech 2008b

Because receptor-specific HI values for each boiler and for all boilers operating at once are less than 1, EEC operations at the South Plant Site would not adversely affect assessment endpoints for terrestrial and aquatic receptors and communities.

COPC-specific HQs and receptor-specific HIs for all scenarios are provided in Appendix E of Tetra Tech (2008a).

Risks to Special Status Species

Within the assessment area, there are several state and federal special status species, including two butterflies (White River wood nymph and Steptoe Valley crescentspot), a fish (relict dace), the pygmy rabbit, and three springsnails (southern Steptoe pyrg, sub-globose Steptoe Ranch pyrg, and Landyes pyrg). Based on the low HQ values for the soil invertebrate community, adverse effects to butterfly larvae as a result of plant site emissions would not be expected. Similarly, the low aquatic life HQ values indicate that relict dace would also not be adversely impacted. The cottontail rabbit is used as surrogate for the pygmy rabbit, as both have similar life histories and feeding habits.

Because springsnails are potentially sensitive receptors (Bowler 2004), the U.S. EPA ECOTOX database was searched for aquatic toxicity information on aquatic snails (Tetra Tech 2008a). Toxicity data were compared to the concentrations of COPCs estimated for McGill Spring and Schoolhouse Spring for the five compounds that presented the highest HQ values, including cobalt, copper, lead, methyl mercury, and selenium. The database search focused on identifying

"no effect" concentrations associated with relevant endpoints, such as reproductive effects, from long-term studies with aquatic snails. LC50 values were found for cobalt, copper, lead, and methyl mercury for the ramshorn snail (Family *Planorbidae*). LC50 values for all four compounds were significantly higher than the anticipated media concentrations for the EEC operations, and therefore no adverse effects to springsnails are anticipated from these compounds. Selenium records were not found in the database; however, given the low modeled media concentrations of selenium, and the fact that selenium is generally less toxic than the other metals, toxicity stemming from selenium exposure would not be predicted. It should be noted that toxicity data for the springsnail genus *Pyrgulopsis* (Family *Hydrobiidae*) is not present in the ECOTOX database, as long-term toxicity studies have not been conducted for those species.

4.6.2.2 Direct and Indirect Effects on Air Quality from Electric Transmission Facilities

Under the Segment 4A routing to the SWIP Corridor and then south to Robinson Summit Substation, the closest residence would be a home in the Butte Valley Estates 1.5 miles from the line. From the Robinson Summit Substation south, the transmission line would follow the SWIP Corridor to the Harry Allen Substation in Clark County. The only places where that line would come within 3 miles of a residence or area of regular human activity would be well to the south. Near the junction of Segments 9D and alternative Segment 10, plus along Segment 11, the Coyote Springs residential and commercial development would come as close as 1 mile from the line. Segment 11 would also pass within 2 miles of the Moapa Indian Reservation.

Construction

Total acreage for earth moving activities for the transmission line facilities duration of nine months for the EEC-RS or alternative EEC-HA routing via Segment 4A to Segment 1D to Robinson Summit is estimated to be approximately 9,400 acres. Using the Segment 3 alternative would be a comparable length and cover comparable acreage. Using an emissions factor of 0.11 ton/acre/month and assuming 10 percent of the acreage would be experiencing active earthmoving at any one time, the total PM_{10} emissions are estimated to be 930 tons. This assumes watering of the earth moving areas several times each day for dust control. Emissions would be spread out over hundreds of miles and over months of construction. Impacts would be brief, temporary, and likely small in magnitude at all residences because of their setback from the construction locations.

Operations, Maintenance, and Abandonment

Reclamation of impacts during construction would reduce the acreage of disturbed ground along transmission lines created during the construction phase to approximately 1,100 acres under the Proposed Action, and to a comparable acreage under the alternative Segment 3 routing. That would reduce the areas along the transmission lines where soil disturbance could result in dust generation by approximately 88 percent cumulatively as the project becomes operational. Isolated impacts from dust could persist near the remaining areas where transmission facilities would feature soil disturbances. Operation, maintenance, and potential abandonment of the electrical transmission power systems would have negligible impacts on air quality.

4.6.2.3 Direct and Indirect Effects on Air Quality from Water Supply Facilities

The Proposed Action would include wells outside Lages Station, with a pipeline from there to the South Plant Site. The nearest developed area of human activity to the well site would be the gas station at the intersection of US-93 and Alt 93, approximately 1.5 miles away. Alternatives include supplemental water supply from wells at the South Well Field, the Coyote Valley Ranch,

or the Middle Well Field, or from an impoundment in Duck Creek Valley. All but the Duck Creek Valley impoundment are along the same water line corridor, which would also share the same alignment as the Alternative Rail Line, if selected from the Lages Station Well Field to the plant site. The proximity of residences to that rail line is documented in **Section 4.6.2.4**. The closest any of those alternative well sites is to a developed human activity area is one of the Middle Well Field wells, within 1 mile of the Schellbourne Café. The Duck Creek Valley water pipeline would be less than one quarter the length of the Lages Station pipeline, but both the impoundment and portions of the line would be within 200 yards of residences in the Duck Creek Valley area.

Construction

The emission factor for water supply line construction is 0.42 ton/acre/month for active disturbance by earth moving equipment (WRAP Fugitive Dust Handbook). Assuming 30 percent of the total pipeline ROW area is under active construction at one time, the total PM_{10} emissions are estimated to be 907 tons. The construction would result in temporary and generally low intensity impacts in all areas of regular human activity, except that impacts could potentially reach significant contribution thresholds for a week or two for residents in Duck Creek Valley near the impoundment or along the pipeline if that alternative is chosen that could be briefly be of higher intensity.

Operations, Maintenance, and Abandonment

Reclamation of construction impacts would reduce the extent of disturbed ground along the water pipeline created during the construction phase to a 60-foot width. That would reduce dust generation by approximately 50 percent (compared to if the total disturbed area was not reclaimed). Low intensity impacts from dust could persist near the remaining non-reclaimed areas where the water line corridor would feature soil disturbances. Overall, the operation of the water supply system would have little impact on air quality. Maintenance of the Duck Creek water line, if that alternative was chosen, could briefly and very intermittently result in significant contributions to dust levels for nearby residents. Abandonment of the water lines is not anticipated. The facilities could be decommissioned without much tear down, or the pumping stations could be used to supply water elsewhere.

4.6.2.4 Direct and Indirect Effects on Air Quality from Rail Facilities

No human residences occur near the rail lead. The human residences or areas of regular human activity nearest the Alternative Rail Line would be the Schellbourne Bar and Café 0.6 miles to the east and the Magnuson Ranch 0.9 miles to the west.

Construction

Construction of the rail lead from the NNRy to the South Plant Site would result in disturbance to 55 acres generating approximately 14.5 tons of PM_{10} over a 24-month period.

Regarding the Alternative Rail Line, it is estimated that railroad construction would be approximately 100 miles long for a duration of 24 months. The total amount of disturbed ground, to the South Plant Site, including the co-located water line from Lages Station south, would be approximately 3,000 acres. It is assumed that 10 percent of the ROW would be disturbed by active earth moving equipment at any one time. With an emission factor of 0.11 ton/acre/month, the PM_{10} emissions for the 24-month period is estimated to be 808 tons PM_{10}.

Emissions would generally be lower in reconstructing the NNRy line than building the new Alternative Rail Line. Construction impacts would be temporary, spread out over distance and time to have little effect at any residence.

Operations, Maintenance, and Abandonment

Wind erosion along the rail tracks would be significantly reduced from levels during construction because the rail tracks and revegetation, where it is not prevented, would stabilize the soils.

The Proposed Action would represent the return of train traffic through the valley discontinued in the late 1980s. The annual air pollutant emissions from the diesel train engines exhaust between Shafter and the South Plant Site with the EEC operating at maximum capacity were estimated to be 27.2 tons of VOCs, 108.7 tons of CO, 365.5 tons of NO_x, 28.8 tons of SO_2, and 22.2 tons of PM_{10}. Brief locomotive exhaust air quality impacts are estimated to extend up to a few hundred yards from the train tracks when each train passes.

The train traffic rate using the Alternative Rail Line would equal that described for the NNRy.

Brief locomotive exhaust air quality impacts are estimated to extend up to a few hundred yards from the train tracks when each train passes. This would represent a long-term impact, with significant air pollutant contributions within approximately 100 yards where there are not currently any residences, and lower impacts beyond. The majority of the few residences or areas of regular human use within the area of significant contributions range would not be seeing new impacts, but a return of impacts previously experienced during earlier periods of NNRy operation.

Abandonment of the rail line is not anticipated. If abandoned, the tracks would likely remain in place, with the major difference from the operational phase being the lack of or decrease in train exhaust.

4.6.2.5 Mitigation

1. For project construction outside the power plant site, construction staging areas will be placed no closer than 500 feet of residences.
2. Car pooling will be encouraged by project proponents during construction and operation of the EEC and associated project development.
3. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard, which is the distance from the top of the truck bed in the material being hauled.
4. Sweep streets of visible soil material carried onto adjacent paved public streets.

4.6.2.6 Unavoidable Adverse Impacts on Air Quality

The Proposed Action would result in temporary construction impacts of fugitive dust and engine exhaust and long-term air quality impacts from emissions of air pollutants as described above.

4.6.2.7 Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources would include the mining of coal, and the use of fuel to transport it to the EEC. The mining that represents the irretrievable commitment of the coal resources is already planned and underway. Therefore, this project does not drive those commitments associated with coal extraction and transport. Deposition of acids, metals, and other materials resulting from the combustion of coal and atmospheric processes and dispersion of the resulting exhaust would occur.

Greenhouse gases would be emitted from the combustion of the fuel, however, existing climate prediction models are global in nature; therefore they are not at the appropriate scale to estimate potential impacts of climate change. Air quality would not be considered irretrievably

impacted, though, since cessation of activity at the facility at any time in the future would eliminate those emissions.

4.6.2.8 Relationship of Short-term Uses and Long-term Productivity

There would be short-term air quality impacts from construction of the facilities, which would not affect the long-term productivity characteristics of the area. The contribution of the project to the local and regional power supply would support long-term economic development for the markets served by the project.

4.6.3 North Plant Site Alternative

The near field direct impact area for the North Plant Site is essentially the same as for the Proposed Action except that it is centered around the alternative plant site. The maximum extent of potential significant contributions in the Class II area is 45.3 kilometers (28.1 miles) from the proposed EEC.

The area in which potential EEC air quality impacts predicted by air dispersion models reached or exceeded air permitting significant contribution levels for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter less than 10 microns in diameter (PM_{10}) are shown in **Figures 4.6-3** and **4.6-4**. The maximum significant contribution radius in **Figure 4.6-4** is a radius equal to the distance to the furthest point at which significant contributions are predicted.

4.6.3.1 Direct and Indirect Effects on Air Quality from Plant Site

Construction

Emissions would be the same as reported for the Proposed Action with the exception of employee commute distance, and the shift in location of the activities to the North Plant Site.

Operations, Maintenance, and Abandonment

Emissions

HAP, CO_2, and greenhouse gas emissions would be the same as reported for the Proposed Action.

Criteria Air Pollutant emissions would also be the same as reported for the Proposed Action for all emission source categories except material handling, which made up less than ten percent of the particulate emissions and did not contribute to the emissions of any other pollutant. The differences in material handling emissions would be minimal. Those emissions, and the locomotive emissions, would be distributed spatially across the North Plant Site a little differently than they would be at the South Plant Site because of the L-shaped property associated with the North Plant Site alternative.

Employee Commuter Emissions

The same assumptions used for the operations at the South Plant Site apply at the North Plant Site; except that the paved road traveling distance is estimated to be 16 miles round trip per day (11 percent less than under the South Plant Site). Vehicle exhaust emissions would correspondingly be 11 percent less than those described for the South Plant Site. The maximum annual PM_{10} fugitive emissions resulting from employees commuting were estimated to be 22 tons/year.

Ambient Air Quality Impacts

Class I Area and FLM Identified Sensitive Class II Area Impacts

Air quality modeling analyses verified by NDEP showed that maximum NO_2 and PM_{10} impacts predicted in the two Class I areas and maximum predicted impacts for all three pollutants at the FLM-identified sensitive Class II areas were below the PSD significant contribution threshold at both Class I areas and both FLM-identified Class II areas. SO_2 impacts from the Proposed Action were determined by NDEP to exceed the Class I significant contribution threshold), the threshold above which cumulative incremental degradation analyses are required, as they were under the South Plant Site, but to not approach the PSD limit for incremental degradation in SO_2 concentrations. That cumulative PSD analysis of incremental degradation in SO_2 air quality levels is included in **Section 5.6**.

Class II Area Impacts

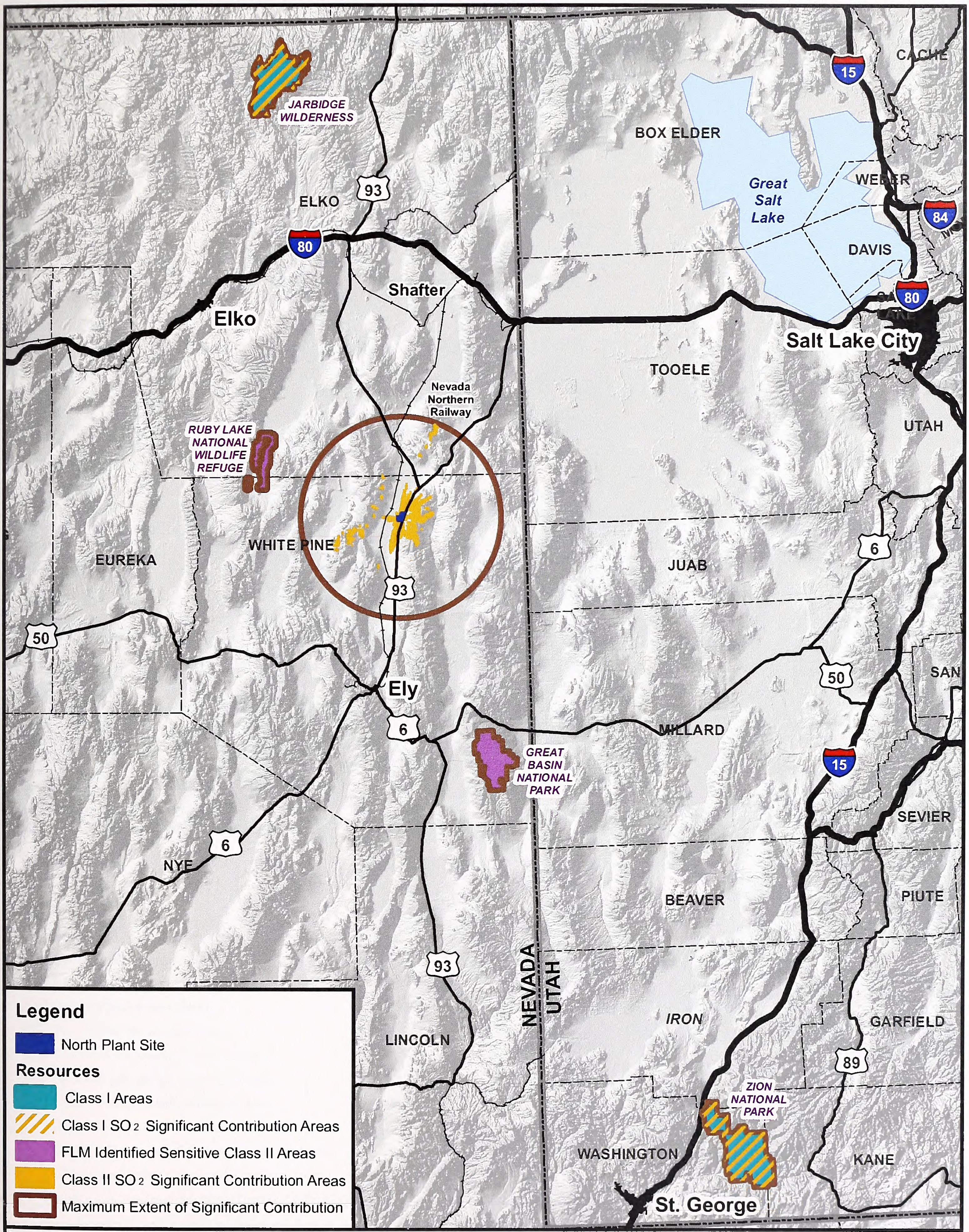
Shaded areas in **Figures 4.6-3** and **4.6-4** show the areas where maximum air quality impacts exceeding Class II SILs are predicted for NO_2, SO_2, and PM_{10}, respectively. Class II SILs for CO are not predicted to be exceeded.

The maximum impacts predicted from the North Plant Site operations are quantified in **Table 4.6-7**. That table shows that the North Plant Site would not exceed federal and state limits for incremental degradation, and that facility impacts combined with measured background concentrations would not approach national or Nevada ambient air quality standards. Impact predictions are generally higher for analyses using Ely Yelland Field meteorological data, partly because the North Plant Site is approximately 25 miles north of Yelland Field and subject to different local meteorological conditions further north up Steptoe Valley.

TABLE 4.6-7. AIR QUALITY MODELING PREDICTED MAXIMUM: NORTH PLANT SITE

POLLUTANT	AVER. PERIOD	EEC MET. DATA MAXIMUM MODELED CONC. (μG/M³)(A)	ELY YELLAND FIELD MET. DATA MAXIMUM MODELED CONC. (μG/M³)(A)	BACKGR. CONCS. MEASURED ONSITE (μG/M³)	TOTAL CONCS EEC MET. DATA IMPACT PLUS BACKGR (μG/M³)	DISTANCE AND ORIENTATION OF MAXIMUM IMPACT LOCATION FROM PROPOSED BOILER STACKS	PSD INCREMENT LIMIT IN CLASS II AREAS	NAAQS AND NEVADA AAQS (μG/M³)
NO_2	Annual	9.4	20.1	4.5	13.9	1.6 miles NNE	25	100
PM_{10}	24 hours	26.0	22.6	13.5	39.5	0.8 miles W	30	150
	Annual	6.5	4.9	4.3	10.8	0.7 miles NE	17	50
SO_2	3 hours	129	415	4.0	133.0	4.5 miles SE	512	1300
	24 hours	6.5	17.9	3.0	9.5	2.0 miles NNE	91	365
	Annual	0.85	1.19	3.0	3.85	2.0 miles NNE	25	80
CO	1 hour	248	656	1636	1884	1.4 miles NNE	NA	40000
	8 hours	79	93.7	1272	1351	1.5 miles NNE	NA	10000

a The NO_x to NO_2 conversion factor of 0.75 is applied



Source: SO_2, NO_2 and PM_{10} Modeling: TetraTech 2008
Base Map: National Atlas of the United States

1:2,400,000

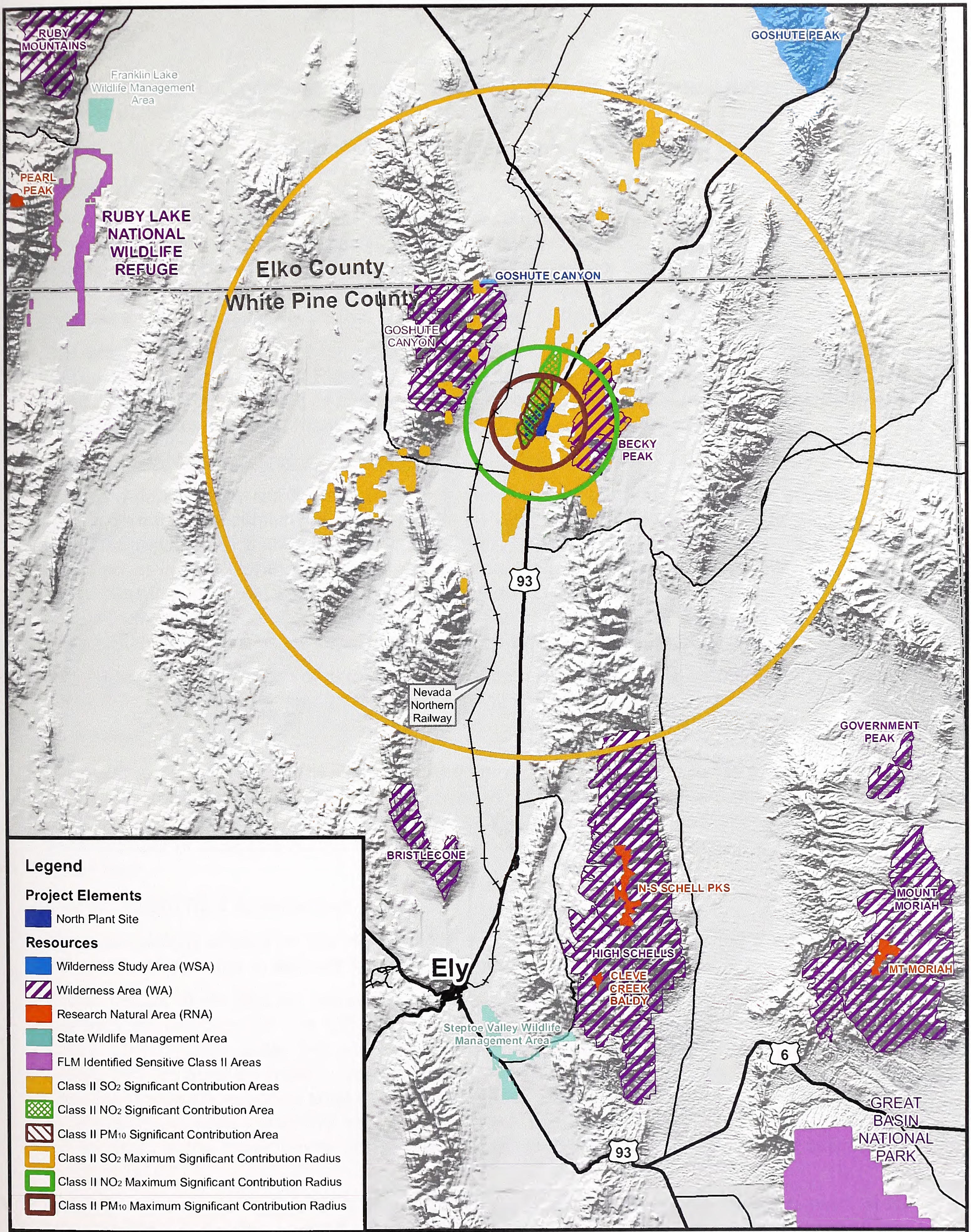
20 0 40 Miles

20 0 80 Kilometers

Scale is 1:2,400,000 when printed at 8.5"x11"

N

FIGURE 4.6-3
DIRECT IMPACT AREA FOR
ALTERNATIVE ACTION AIR QUALITY ANALYSIS
ELY ENERGY CENTER



Source: SO_2, NO_2 and PM_{10} Modeling: TetraTech 2008, WA and WSA: Bureau of Land Management, WA and RMA: U.S. Forest Service
Base Map: University of Nevada, Reno and ESRI

1:720,000

5 0 10 Miles

2,0000 18,000 Meters

Scale is 1:720,000 when printed at 8.5"x11"

N

FIGURE 4.6-4
CLASS II DIRECT IMPACTS FOR
ALTERNATIVE ACTION AIR QUALITY ANALYSIS
ELY ENERGY CENTER

The significant SO_2 contribution contours shown in **Figures 4.6-3** and **4.6-4** reach or cover portions of the Becky Peak and Goshute Canyon Wilderness Areas.

The impacts of potential abandonment would be the same as described for the South Plant Site.

Visibility / Regional Haze

The consistent results and NDEP concurrence during their review of the facility's permit application that the visibility analyses described for the South Plant Site demonstrates compliance with applicable visibility impact limits clearly indicate that they would reach the same conclusion for the North Plant Site. Considerably more detail of the visibility impact analyses on potential impacts to sensitive Class II areas is included in **Appendix 4A**.

The analyses of the potential for localized fogging or inversion trapping pollutants in Steptoe Valley reported for the South Plant Site, showing little threat of pollutant concentrations above those reported from modeled results or fogging affecting local conditions as far as US-93, are representative for the North Plant Site Alternative as well.

Deposition of Nitrates and Sulfates

Predicted deposition levels for this alternative, like those for the South Plant Site, are within the BLM recommended cumulative range across all Class I and Class II areas analyzed. Those predicted impacts are slightly lower for Great Basin National Park, but the one percent increase predicted as a result of the Proposed Action would still bring operational nitrogen deposition levels near the threshold at which the National Park Service observed acidification impacts in high mountain ecosystems in Rocky Mountain National Park. More details of the deposition impact analyses and potential impacts to sensitive Class II areas is included in **Appendix 4A**.

The impact of the deposition of nitrates, sulfates, and other compounds including mercury closer to the EEC was assessed through the application of a risk assessment model.

Risk Assessment

The methodology for the North Plant Site Alternative analysis was the same as that described for the South Plant Site. Because of differences in parcel shapes and layouts between the two facilities, the receptor network for the North Plant Site analysis featured more receptors. The larger number of receptors for the North Plant Site is due to the longer fence line that the parcel would have.

Human Health Risk Assessment

The methodology utilized for the HHRA is the same as that described for the South Plant Site, except for refinements to account for site specific geographic differences.

HHRA results show that no receptor studied would be exposed to total excess cancer risks reaching the threshold of 1 in 100,000 ($1x10^{-5}$). Three receptors exceeded the target of 1 in 1 million ($1x10^{-6}$) only under the unlikely scenario of maximum emissions from both the main boilers and the auxiliary boilers over the long term. Those three potentially impacted receptors were the maximally exposed adult subsistence farmer with a risk of $2x10^{-6}$, an adult subsistence fisherman living in the maximally exposed residential area with the same risk, and a subsistence farmer living at the maximum air concentration location (where no farming currently exists) with a risk of $1x10^{-6}$.

All those risks are within the EPA acceptable range of 10^{-4} to 10^{-6}. Subsistence farmers at all locations where ranching currently exists were predicted to have excess cancer risks of 10^{-6} (1 in 1 million) or less. Excess cancer risks associated with emissions from the energy center

main boilers, which should represent the vast majority of boiler emissions over the long term, were predicted to be less than 1 in 1 million. Only the conservative assumption of maximum emissions from the main boilers and simultaneous maximum production from the auxiliary boilers as well, an unlikely scenario for any duration, results in any risk greater than 1 in 1 million.

Maximum total hazards calculated were 0.25 for a subsistence farmer's child living in the maximally exposed residential area, well below the recommended screening threshold of 1. The maximum acute hazard quotient (AHQ) calculated for any receptor studied reached the screening threshold of 1 only at the unoccupied maximally exposed location (where there is no regular human activity). The maximum predicted ADD_{infant} exposure rate of 2.7 pg/kg for the child of a subsistence farmer is well below the EPA recommended safety screening threshold of 93 pg/kg.

Ecological Risk Assessment

The methodology for the North Plant Site ERA was the same as that described for the South Plant Site, except Duck Creek and Schoolhouse Spring were used as the aquatic habitats instead of Bassett Lake and McGill Spring.

Because receptor-specific HI values for each boiler and for all boilers operating at once are less than 1, operation of the North Plant Site would not adversely affect assessment endpoints for terrestrial and aquatic receptors and communities.

Risk Assessment Summary

The HHRA indicates that the operation of neither the Proposed Action South Plant Site nor the Alternative Action North Plant Site would cause undue risk to the maximally affected people in the region over the short term or the long term. The SLERA indicates that emissions from the Proposed Action South Plant Site or the North Plant Site Alternative would not adversely affect the terrestrial and aquatic communities of Steptoe Valley or the montane areas east and west of the valley (Tetra Tech 2008a).

Risks to special status species would be the same as for the Proposed Action.

4.6.3.2 Direct and Indirect Effects on Air Quality from Electric Transmission Facilities

The construction emission and operational impact profiles would be similar to those described for the South Plant Site. The only differences would be the locations of the activities, the approximately 20 mile longer length of the transmission lines, and the potentially affected populations in their vicinity. The nearest residence to the transmission line route 1B would be the Borchert Ranch 0.5 miles away. Construction impacts would be minor, possibly very briefly reaching significant contribution levels locally. The alternative Segment 1A from the North Plant Site would pass no closer than 2 miles from any residence or area of regular human activity. The Segment 1C connecter would pass within 0.5 miles of the closest residence, trailers in Monte Neva. Construction impacts would be minor at all residences, possibly briefly reaching significant contribution levels at the Borchert Ranch. Operational impacts would be as described for the South Plant Site.

4.6.3.3 Direct and Indirect Effects on Air Quality from Water Supply Facilities

The construction emission and operational impact profiles would be similar to those described for the South Plant Site. The locations of the water line along the Alternative Rail Line, whether or not that option is chosen, would be as described for the South Plant Site. The pipeline would

start at the same well field near Lages Station. The pipeline run would be approximately 15 miles shorter. Alternative well field and water supply lines would also generally be closer to the North Plant Site, reducing overall acreage impacts, with the exception of the southern-most well fields. No residences would be within 2 miles of the North Plant Site specific development, except for any described for the South Plant Site water supply alternatives that could also be impacted under the North Plant Site Alternative.

4.6.3.4 Direct and Indirect Effects on Air Quality from Rail Facilities

Construction

There are no residences within 2 miles of the rail lead. Construction emissions would be generally the same as the South Plant Site, except that emissions estimates would be greater for the rail lead to the North Plant Site because it is almost four times longer in length.

Regarding the Alternative Rail Line, the line would be approximately 37 miles shorter, thus reducing the emission estimates from what was described for the Proposed Action.

Operation

Air impacts under the North Plant Site Alternative for the Alternative Rail Line would match those described for the South Plant Site for the first 64 miles south of Shafter. From that point south, the impacts of the operation of approximately 34 miles of rail line and rail lead to the South Plant Site would be replaced by proportionally smaller impacts along approximately 5.5 miles of rail lead to the North Plant Site.

Because the total rail line distance from Shafter to the EEC by the NNRy, including the rail spur with the NNRy, would differ in distance by less than one percent from the distance by the Alternative Rail Line, the emission estimates for the Alternative Rail Line above are considered appropriate for either the NNRy or the Alternative Rail Line.

4.6.3.5 Mitigation

The same mitigation measures discussed under the Proposed Action in **Section 4.6.2.5** would apply to the North Plant Site alternative.

4.6.3.6 Unavoidable Adverse Impacts on Air Quality

Unavoidable adverse impacts would be the same as described in **Section 4.6.2.6**.

4.6.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described in **Section 4.6.2.7**.

4.6.3.8 Relationship of Short-term Uses and Long-term Productivity

The relationship of short-term uses and long-term productivity would be the same as described in **Section 4.6.2.8**.

4.6.4 No Action Alternative

The No Action Alternative would not result in any construction or operational air emissions associated with this project. The only changes in air quality impacts in the local area would come from future projects or alternative uses of the land. However, if the EEC were not built, the expected electricity demand would need to be satisfied from other sources that would impact areas in and around the vicinity of those generation sources. As the exact profile and site-specific emissions of these other sources are undefined at this point, a quantitative air quality impact analysis is beyond the scope of this EIS. It is assumed that existing land and

resource conditions have already been affected by climate change, and will continue to be affected by climate change under the No Action Alternative.

4.6.5 Resource Impact Summary

The two action alternatives propose to build and operate the same 1,500 MW generation station at two different locations approximately 35 miles apart in Steptoe Valley. Though there would be slight differences in layout based upon the shapes of the similar sized parcels, the ambient air impacts of the two action alternatives during construction and operation would be similar in magnitude. Impacts on air quality exceeding PSD significant contribution levels but not approaching national and state ambient air quality standards would be anticipated in all Class II areas. At the only two Class I areas within 300 kilometers of the proposed EEC, predicted air quality impacts would be below significant contribution thresholds for all pollutants except SO_2, and within PSD limits for incremental degradation for that pollutant. The extent of significant contributions to air pollutant levels in and around Steptoe Valley would be similar, the locations offset to focus around the proposed EEC locations. AQRV visibility and deposition impacts are demonstrated to be within thresholds set by the BLM with consultation with FLMs, though the National Park Service has expressed concerns over those impacts in Great Basin National Park.

Railroad service would come from Shafter to the north. The rail line serving the North Plant Site Alternative would be shorter than the rail line for the South Plant Site. Therefore, the 1.4 train round-trips per day would cover 35.5 to 39.4 less miles with the North Plant Site Alternative than with the South Plant Site. Emissions from trains would be approximately one-third less with the North Plant Site than with the South Plant Site.

Table 4.6-8 offers a comparison of air quality impacts associated with each alternative.

TABLE 4.6-8. COMPARISON OF AIR QUALITY IMPACTS

		PROPOSED ACTION SOUTH PLANT SITE	NORTH PLANT SITE ALTERNATIVE	NO ACTION ALTERNATIVE
Construction	EEC	Significant contributions to air pollutant levels quite localized, mostly dust, minor impacts from commuting and equipment operation	Significant contributions to air pollutant levels quite localized, mostly dust, minor impacts from commuting and equipment operation	No impacts other than current, some blowing dust
	Offsite	Significant contributions to air pollutant levels when near human activity quite localized, mostly dust, minor impacts from equipment operation	Significant contributions to air pollutant levels when near human activity quite localized, mostly dust, minor impacts from equipment operation	No impacts other than current, some blowing dust
EEC Operation	Air Pollutant Emissions (tons/yr)	PM_{10} 1,788 | NO_2 4,853 | SO_2 4,628 | CO 7,720 | VOCs 285	PM_{10} 1,788 | NO_2 4,853 | SO_2 4,628 | CO 7,720 | VOCs 285	None
	Maximum Predicted Annual Average AQ Impact Offsite (μg/m³)[1], Comparison against NAAQS	PM_{10} NO_2 SO_2 9.4 5.2 6.9 μg/m³ 18.2% 5.2% 8.6% % of NAAQS Distance and direction of maximum impact from energy center 0.7 1.6 2.9 miles NE NNE NNE	PM_{10} NO_2 SO_2 6.5 9.4 1.2 μg/m³ 13.0% 9.4% 1.5% % of NAAQS Distance and direction of maximum impact from energy center 0.7 1.6 2.9 miles NE NNE NNE	None
	Maximum Extent of Significant Contribution to Air Pollutant Levels[1]	PM_{10} NO_2 SO_2 12.4 8.8 43.8 km 7.7 5.5 27.2 miles	PM_{10} NO_2 SO_2 6.6 10.5 45.3 km 4.1 6.5 28.1 miles	None
	Risk to Public and Ecological Health	Maximum exposure within EPA acceptable risk range, Maximum excess cancer risk was 1 in 125,000 at very conservatively defined receptor, less than 1 in 1 million for any likely actual receptor.	Maximum exposure within EPA acceptable risk range. Maximum excess cancer risk was 1 in 333,333 at very conservatively defined receptor less than 1 in 1 million for any likely actual receptor.	None
	Visibility Degradation at FLM-identified Sensitive Areas (% of days with b_{ext} > 5% / 10%[2]	Jarb Zion GBNP RLNWR Days > 5% 0.7% 0.0% 17,7% 3.4% Days > 10% 0.0% 0.0% 6.6% 0.4% Max Δb_{ext} 6.3% 2.8% 18.8% 11.4%	Jarb Zion GBNP RLNWR Days > 5% 1.4% 0.0% 11.2% 4.3% Days > 10% 0.1% 0.0% 3.4% 1.3% Max Δb_{ext} 10.0% 2.8% 15.8% 15.9%	None
	Nitrate and Sulfate Deposition at Class I Areas and GBNP	Jarb Zion GBNP RLNWR Nitrogen 0.002 0.001 0.037 0.004 Sulfur 0.004 0.003 0.075 0.011 Kg/hectare/yr, average over 3 years	Jarb Zion GBNP RLNWR Nitrogen 0.002 0.001 0.013 0.005 Sulfur 0.005 0.003 0.026 0.014 Kg/hectare/yr, average over 3 years	None
Rail Line	Air Quality Impacts	Long term significant contribution to air pollutant levels within approximately 100 yards of the rail line, insignificant impact elsewhere	Long term significant contribution to air pollutant levels within approximately 100 yards of the rail line, insignificant impact elsewhere	Continued dust emissions from abandoned NNRy line
	Area Affected	From the mine site to UPRR site in Shafter and approximately 100 miles south to the South Plant Site	From the mine site to UPRR site in Shafter and approximately 65 miles south to the South Plant Site	Abandoned NNRy line south from Shafter
Operation of Offsite Support Services		Insignificant impacts except for potential isolated and mostly intermittent significant contributions to air pollutant levels	Insignificant impacts except for potential isolated and mostly intermittent significant contributions to air pollutant levels	Insignificant impacts from dust and natural emissions

[1] AQ Modeling Impacts were from analyses using meteorological data collected at the proposed EEC sites, for receptors at any distance, near or far. Maximum impact locations were

[2] Proposed FLAG visibility methodology using CALPUFF Method 2 post-processing, Tier II results

4.6.6 Climate Change

Climate change analyses are comprised of several factors, including greenhouse gas (GHG) emissions, land use management practices, the albedo effect, etc. The tools necessary to quantify specific climatic impacts of those factors are presently unavailable. As a consequence, impact assessment of specific effects of anthropogenic activities cannot be determined. Additionally, specific levels of significance have not yet been established. Therefore, climate change analysis for the purpose of this document is limited to accounting and disclosing of factors that contribute to climate change. Qualitative evaluation of potential contributing factors is included where appropriate and practicable. Some of the GHGs associated with each alternative and their activities would be naturally sequestered, while the balance of those emissions would accumulate with GHG concentrations in the atmosphere. This in turn would contribute to further manifestations of climate change.

4.6.6.1 Proposed Action

Greenhouse Gas Emissions from the Ely Energy Center

As with any fossil-fuel fired project or activity, the EEC would contribute to global emissions of greenhouse gasses, including carbon dioxide, methane, and nitrous oxide.

Sierra Pacific Resources (SPR) used the U.S. Department of Energy's - Energy Information Administration (EIA) voluntary reporting of greenhouse gases program calculation method to estimate CO_2 emissions. The full list of emission factors can be found through the following link: http://www.eia.doe.gov/oiaf/1605/coefficients.html.

This calculation method is an estimate at this time due to the lack of detailed design information about the boiler ultimate vendor, coal specification, and future operating conditions, etc. For Sub Bituminous coal, the emission factor is 212.7 lb CO_2/mmBtu. The EEC would have an estimated 85 percent capacity factor, projected 8,900 Btu/KWH heat rate and 13,350 mmBtu/hr of heat input. EIA provides the following equation to estimate CO_2 emissions (EIA ND):

$$E = FC \times CECo$$

Where:

- E = carbon dioxide emissions (in pounds)
- FC = energy consumption (in million Btu [mmBtu])
- CECo = carbon dioxide emissions factor (in pounds of carbon dioxide/mmBtu).

For the EEC, substituting the estimated values,

- Tons CO_2 /year = 13,350 mmBtu/hr X 212.7 lb CO_2/mmBtu X (1 ton/2000 lbs) X 8,760 hrs/yr X 0.85 capacity factor =**10,571,625 tons CO_2/year**

Greenhouse gases also include methane (CH_4) and nitrous oxide (N_2O) that would be emitted from the facility. SPR again used EIA's Voluntary Reporting of Greenhouse Gases Program, which refers to *EPA's Compilation of Air Pollutant Emission Factors* (AP-42) for estimates of CH_4 and N_2O. Typically, the quantities of these gases are multiplied by a Global Warming Potential (GWP) due to their ability to increase heating effect in the atmosphere at a rate which differs from that of CO_2 on a per-unit basis; multiplying by this factor results in a CO_2 Equivalent value (CO_2(e)) that is additive.

For Sub Bituminous coal, the emission factors are 0.0023 lb CH_4/mmbtu and 0.0017 lb N_2O/mmbtu.

Using an estimated 85 percent capacity factor and 13,350 mmbtu/hr of heat input:

- CH_4 tons/year = 13,350 X 0.0023/2000 X 8,760 X 0.85 = **114.32 tons CH_4/year**
- N_2O tons/year =13,350 X 0.0017/2000 X 8,760 X 0.85 = **84.49 tons N_2O/year**

Using the GWP factors from the IPCC Fourth Assessment Reports (Solomon et al. 2007):

1 ton CO_2 = 1 ton CO_2(e) 1 ton CH_4 = 21 tons CO_2(e) 1 ton N_2O = 310 ton CO_2(e)

So combining these gives:

- 10,571,625 tons CO_2 /year X (1 ton CO_2(e)/1 ton CO_2) = 10,571,625 tons CO_2(e)/year
- 114.31 tons CH_4 X (21 ton CO_2(e)/1 ton CH_4)= 2,401 tons CO_2(e)/year
- 84.49 tons/year N_2O X (310 ton CO_2(e)/1 ton N_2O) = 26,193 tons CO_2(e)/year

Total = 10,600,219 tons CO_2(e)/year

(from Sierra Pacific Resources 2007, *Greenhouse Gas Information Submittal*)

Table 4.6-9 uses IPCC data to compare the potential EEC CO_2 emissions (an increase of 10.57 million tons per year in carbon dioxide) to the global total CO_2 emissions.

TABLE 4.6-9. COMPARISON OF CARBON DIOXIDE EMISSIONS FROM THE ELY ENERGY CENTER

CARBON DIOXIDE EMISSION SOURCES	CARBON DIOXIDE EMISSIONS (MILLION TONS/YEAR)	SOURCE OF DATA
Global CO_2 flux between land, water & atmosphere (673,200 from natural sources; 54,400 anthropogenic)	727,600	IPCC (Figure 7.3, p. 515,Denman et al 2007)
Annual global CO_2 emissions from fossil fuels (2000-2005)	26,400	IPCC (p. 2, IPCC 2007)
Annual global CO_2 emissions from coal-fired power plants	7004	Stern Review on the Economics of Climate Change, Annex 7.b
Ely Energy Center	10.57	EPA's AP-42 emission factors (see above)

The tools necessary to quantify specific climatic impacts of those factors are presently unavailable. As a consequence, impact assessment of specific effects of anthropogenic activities cannot be determined. Additionally, specific levels of significance have not yet been established. Therefore, climate change analysis for the purpose of this document is limited to accounting and disclosing of factors that contribute to climate change.

4.6.6.2 No Action Alternative

For the Proponents to comply with the orders of the PUCN and supply adequate power to their customers without increasing their dependence on purchased power, they must increase their generating capacity (see **Sections 1.2 and 1.3**, Purpose and Need). At the same time, the Proponents have been charged with increasing their system-wide ratio of renewable power sources to fossil fuel sources.

The No Action Alternative describes what could occur if the EEC is not developed; essentially the Proponents would be obligated to supply power to their customers using other sources.

These other sources, using fossil fuels for the most part, would have associated greenhouse gas emissions. Consequently, while the No Action Alternative means there would be no direct greenhouse gas emissions from the proposed EEC, there would likely still be greenhouse gas emissions associated with supplying the Proponents' customers with energy from other sources. In addition, development of the EEC Project could facilitate: the closure and decommissioning of 300 MW capacity of the Reid Gardner Power Plant (units 1, 2, and 3); construction of renewable energy generating facilities using the same transmission lines constructed to distribute power generated by the EEC Project: and connecting the Sierra Pacific Power Company (SPPC) and the Nevada Power Company (NPC) systems using the proposed EEC Project transmission lines, allowing much greater flexibility in utilizing their combined generating plants and supplying their customers.

Reid Gardner

The Reid Gardner units 1 to 3 that NPC could decommission are coal-fired plants that produce substantially higher emissions of greenhouse gases per megawatt hour than the EEC Project would generate using newer technology (e.g., subcritical versus supercritcal boilers). NPC has suggested that construction of the EEC would provide enough new generating capacity to the Proponents to allow them to decommission Reid Gardner units 1, 2, and 3 when the EEC came on line (PUCN 2007b). **Table 4.6-10** compares measured emissions (combined) from the three Reid Gardner units against projected emissions from an equivalent power output from the EEC (300 MW from the EEC capacity of 1500 MW or twenty percent of the EEC emissions at capacity).

In effect, closing Reid Gardner units 1-3 would reduce the CO_2 emissions by 685,679 tons per year through displacement, as shown in **Table 4.6-10**, although emissions of carbon monoxide (CO), sulfur dioxide (SO_2), and volatile organic compounds (VOC) would be greater.

TABLE 4.6-10. GHG EMISSIONS FROM REID GARDNER UNITS 1, 2, & 3, AND EEC

EMISSION	REID GARDNER UNITS 1,2,3 (~300 MW)		EEC (300 MW OR 20% OF CAPACITY)		DISPLACED EMISSIONS
	TONS/YEAR	LBS/MWH	TONS/YEAR	LBS/MWH	TONS/YEAR
CO_2	2,800,000	2,435	2,114,321	2,059	685,679
CO	234		1,544		-1,310
NO_x	5,160	3.78	971	0.545	4,189
PM	815	0.435 (PM_{10})	358	0.136 (PM_{10})	457
SO_2	700	0.511	926	0.545	-226
VOC	30		57		-27
CH_4 (calculated)	unknown		23		unknown
N_2O (calculated)	unknown		17		unknown

Sources: modified from SPR 2008; SPR 2007

Renewable Energy Resources

The Proposed Action does not specifically include construction of renewable, low GHG emission energy generating plants, but construction of transmission lines for the EEC Project would provide the infrastructure to distribute energy from renewable resource plants in the vicinity of the EEC Project and reduce overall costs of developing those facilities. The Proposed Action could facilitate development of approximately 500 MW of geothermal generating plants with a calculated emission savings (displacement) "based on 2006 average system-wide power mix" (SPR 2008) as shown in **Table 4.6-11**.

TABLE 4.6-11. DISPLACED EMISSION FROM 500 MW OF GEOTHERMAL RENEWABLE PROJECTS

EMISSION	TONS/YR DISPLACED PER 500 MW GENERATED
CO_2	3,793,080
CO	383
NOx	6,154
PM	241
SO_2	3,833
VOC	44

Source: SPR 2008

Other Effects of the No Action Alternative

Development of the EEC would also connect the resources of SPPC (in northern Nevada) with those of NPC (in southern Nevada) with common transmission lines (SPR 2008). This could enhance regional operation of newer, more efficient facilities while limiting older facilities for use during peak load periods.

Without development of the EEC, potential development of new natural gas combined cycle (NGCC) power capacity may be necessary to meet future demand. The consequences of this, while reducing CO_2 emissions relative to the EEC Project (see **Table 4.6-12**), are likely to increase costs of electricity to customers under current economic conditions.

TABLE 4.6-12. GAS EMISSIONS FOR 1500 MW NGCC POWER PLANT

EMISSION	TONS/YR FOR 1500 MW NGCC POWER PLANT
CO_2	4,221,381
CO	45
NOx	300
PM	105
SO_2	23
VOC	21

Source: SPR 2008 (Emission profile is scaled to 1500 MW, based on 2006 Silverhawk facility actual emissions)

Summary

Table 4.6-13 compares potential GHG and other emissions between the Proposed Action and the No Action alternatives. The table is based on the following assumptions:

- Reid Gardner Units 1, 2 and 3 (~300 MW) would be decommissioned
- Renewable energy resources with a capacity of 500 MW would be developed near the EEC Project, and
- 1200 MW of existing purchased power would be displaced.

Estimated greenhouse gas emissions from geothermal electric generating facilities in the U.S. for CO_2, SO_2 and CH_4 were calculated based on average emissions from all geothermal plants in the U.S during 2002 (Bloomfield et al 2003; Geothermal Energy Association 2008); geothermal plants emit zero NO_x and particulate matter (PM).

TABLE 4.6-13. COMPARISON OF POSSIBLE GHG EMISSIONS SCENARIOS UNDER PROPOSED ACTION AND NO ACTION ALTERNATIVES

EMISSION	PROPOSED ACTION (1500 MW EEC + 500 MW GEOTHERMAL POWER PLANT) (TONS/YEAR)	NO ACTION ALTERNATIVE (300 MW REID GARDNER 1700 MW PURCHASED[1]) TONS/YEAR)
CO_2	10,943,907	14,499,482
CO	7,720	1,414
NOx	4,853	24,142
PM	1,788	1,560
SO_2	4,954	12,522
VOC	285	166
CH_4 (calculated)	3,204	Unknown
N_2O (calculated)	84.5	Unknown

[1] based on 2006 average system-wide power mix" (SPR 2008) scaled to 1700 MW

4.6.6.3 Mitigation

No additional mitigation measures are required.

4.7 Vegetation, Including Noxious and Non-Native, Invasive Weeds and Special Status Plants

Both permanent and temporary impacts would occur as a result of the project. Permanent impacts would occur in construction ROWs where project elements would be built, resulting in vegetation loss. Temporary impacts to vegetation would also occur during the construction phase, but they would be short-term and would be reclaimed upon completion of construction.

4.7.1 Indicators and Methods

As described in **Section 1.9.2**, indicators for vegetation resources focus on acreage of vegetative community disturbance, as well as acreage of wetland/riparian communities within groundwater drawdown zones. For noxious and non-native, invasive weeds, indicators focus on the acreage of disturbed areas, including linear elements, and the proximity of existing noxious and non-native, invasive weeds to the disturbance areas. For special status plants, indicators focus on the acreage of disturbance of species habitat, as well as the potential for individual take of special status species. The following factors were considered in determining an effect on vegetation resources, including communities, noxious and non-native, invasive weeds, and special status plants:

- Magnitude of disturbance or loss
- Biological importance of the resource
- Uniqueness or rarity of the resource
- Federal, state, and/or local protection status of the resource
- Susceptibility of the resource to disturbance

4.7.2 Proposed Action: South Plant Site

Direct permanent impacts on vegetation resources would occur because of construction of the power plant, substation, transmission line towers, water supply well field and pipeline, and rail lead. Additionally, temporary impacts would occur during the construction phase due to access road usage and construction corridors. **Tables 4.7-1** and **4.7-2** show the approximate acres of

temporary and permanent impacts of the Proposed Action and the alternative components to the Proposed Action, by vegetative community. Where only temporary impacts are shown, the full acreage would be reclaimed upon abandonment of that project element. Where both temporary and permanent impacts are shown, the difference in acreage between temporary and permanent impacts would be reclaimed. Where only permanent impacts are shown, no reclamation would occur for that element. Permanent impacts would likely be long-term but minor, as the vegetative communities present within each of the project elements are common and widespread throughout the area. BMPs would be implemented to control and minimize the spread of noxious and non-native, invasive weeds, and site-specific surveys would be completed for special status plants prior to construction within suitable habitats to avoid direct effects. Wetland impacts would be avoided in all Proposed Action elements (wetlands are discussed in additional detail in **Section 4.2**). Indirect effects due to construction would be temporary and minor as many of the disturbed acres would be seeded and reclaimed.

Impacts from noxious and non-native, invasive weeds as a result of the Proposed Action are discussed in detail in **Section 4.7.2.5**.

4.7.2.1 Direct and Indirect Effects on Vegetation Resources from Plant Site

Construction

Impacts to vegetative resources resulting from construction of the South Plant Site include direct, permanent disturbance primarily to Douglas rabbitbrush and black sagebrush communities, with winterfat a small (less than 3 percent) component as shown in **Table 4.7-1**. This disturbance would be long-term and minor, as these vegetative communities are common and widespread throughout the Steptoe Valley floor.

Indirect effects include a small area of similar vegetative communities that may be temporarily affected near the perimeter of the construction area, due to trampling or destruction of vegetation by construction equipment and materials staging. These temporarily-impacted areas would be minor, and they would be revegetated with appropriate native species as specified in the Construction, Operation and Maintenance (COM) Plan. Additionally, some existing access roads to the proposed site may see increased vehicular travel, and vegetative communities immediately adjacent to these roads may be affected.

Impacts at the associated worker village would be short-term disturbance of Wyoming sagebrush and greasewood communities on private land. Should the water supply alternative that utilizes the Coyote Valley Ranch Well Field be chosen, then well heads and a pumping station would remain as permanent impacts within the worker village property and the water line corridor, impacting approximately 20 acres of Wyoming sagebrush.

The construction of the Mt. Wheeler Transmission Line would impact approximately 5 acres of Wyoming sagebrush and 3 acres of disturbed land, as well as less than 1 acre each of greasewood, Douglas rabbitbrush, winterfat, and salt desert shrub. These impacts would be long-term and minor.

No Special Status Plants occur within the South Plant Site, associated worker village, or the Mt. Wheeler Transmission Line, therefore no impacts are anticipated during construction.

Operations, Maintenance, and Abandonment

Impacts to vegetative resources resulting from the operation, maintenance, and abandonment of the South Plant Site would be limited to Douglas rabbitbrush and black sagebrush communities at the outer margins of the plant site property during fence line maintenance. These impacts would be short-term and minor.

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TABLE 4.7-1. ACREAGE OF IMPACT TO VEGETATIVE COMMUNITIES ASSOCIATED WITH THE PROPOSED ACTION[1]

VEGETATIVE COMMUNITY AND/OR LAND TYPE	PROJECT ELEMENT																						
	SOUTH PLANT SITE	WORKER VILLAGE	MT. WHEELER LINE[2]	ROBINSON SUMMIT SUB-STATION	HARRY ALLEN SUB-STATION		ELECTRIC TRANSMISSION LINE SEGMENTS - PERMANENT											LAGES STATION WELL FIELD		LAGES STATION WATER SUPPLY PIPELINE		RAIL LEAD	
	PERM	TEMP	PERM	PERM	TEMP	PERM	1D	1E	4A	6A	6C	8	9A[3]	9B	9C[4]	9D	11	TEMP	PERM	TEMP	PERM	TEMP	PERM
Wyoming Sagebrush	0	142	5	73	0	0	26	0.4	1	2	105	4	0	0	0	0	0	0.5	0	363	108	15	10
Creosote Bush	0	0	0	0	32	2	0	0	0	0	0	0	0.5	0	12	40	28	0	0	0	0	0	0
Pinyon-Juniper	0	0	0	6	0	0	22	2	0.5	1	92	0	0	0	0	0	0	0	0	0	0	0	0
Greasewood	0	20	0.7	0	0	0	0	0	0.4	0	37	0	0	0	0	0	0	57	26	209	63	0	0
Douglas Rabbitbrush	1,586	0	0.4	0	0	0	0	0	2	0	0	12	0	0	1	0	0	0	0	244	74	39	26
Joshua Tree	0	0	0	0	0	0	0	0	0	0	0	10	0	0.5	0	0	0	0	0	0	0	0	0
Black Sagebrush	1,304	0	0	3	0	0	4	0	0.1	0	24	2	0	0	0.1	0	0	0	0	8	2	0	0
Winterfat	80	0	0.8	0	0	0	0	0	0.1	0	18	0.1	0	0	1	0	0	0	0	10	0	0	0
Burn/Fire-affected	0	0	0	0	0	0	1	0	0	0	0	0	7	0	0	0	0.6	0	0	0	0	0	0
Blackbrush	0	0	0	0	0	0	0	0	0	0	0	0	25	1	0	0.1	0	0	0	0	0	0	0
Salt Desert Shrub	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	19	0	0
Rubber Rabbitbrush	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	96	29	0	0
Alkaline Meadow	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	27	8	0	0
Desert Playa	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0.2	0	0	0	0	0	0
Shadscale	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	10	3	0	0
Dune	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Disturbed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Wetland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Riparian	0	0	0	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0
Basin Big Sagebrush	0	0	0	0	0	0	0.1	0.1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
Agriculture/Pasture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mountain Big Sagebrush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Open Water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limestone Outcrop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] Values less than 0.1 acre are not reported. Values greater than 1 acre are rounded to the nearest acre.
[2] From Gonder Substation to South Plant Site. Remainder of Mt. Wheeler Transmission Line occurs within the Lages Station Water Supply Pipeline.
[3] Includes only Line 1.
[4] Includes only Line 2.

TABLE 4.7-2. ACREAGE OF IMPACT TO VEGETATIVE COMMUNITIES ASSOCIATED WITH THE PROPOSED ACTION – ALTERNATIVE ELEMENTS[1]

VEGETATIVE COMMUNITY AND/OR LAND TYPE	PROJECT ELEMENT															
	ELECTRIC TRANSMISSION LINE ALTERNATE SEGMENTS - PERMANENT				SOUTH PLANT SITE WATER SUPPLY ALTERNATIVES										ALTERNATIVE RAIL LINE	
	1[illegible]	3	9A[2]	10	REDUCED LAGES STATION W/ COYOTE VALLEY RANCH WELL FIELD		REDUCED LAGES STATION W/ LIMITED SOUTH WELL FIELD		MIDDLE WELL FIELD		SOUTH WELL FIELD		DUCK CREEK IMPOUNDMENT			
					TEMP	PERM	TEMP	PERM	TEMP	PERM	TEMP	PERM	TEMP	PERM	TEMP	PERM
Wyoming Sagebrush	[illegible]	5	0	0	374	112	363	108	305	91	16	5	91	1[illegible]	989	475
Creosote Bush	0	0	0.5	36	0	0	0	0	0	0	0	0	0	0	0	0
Pinyon-Juniper	[illegible]	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0
Greasewood	0	0	0	0	237	74	209	63	49	16	26	[illegible]	0	0	714	346
Douglas Rabbitbrush	0	0.4	0	0	244	74	244	74	230	63	2[illegible]	27	26	8	[illegible]	292
Joshua Tree	0	0	0	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0
Black Sagebrush	0	0	0	0	8	[illegible]	8	2	8	[illegible]	0	0	[illegible]	[illegible]	41	20
Winterfat	0	0.2	0	0	10	[illegible]	10	3	10	[illegible]	16	[illegible]	0	0	30	15
Burn/Fire-affected	0	0.4	[illegible]	25	0	0	0	0	0	0	0	0	0	0	0	0
Blackbrush	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0
Salt Desert Shrub	0	0	0	[illegible]	63	19	63	19	0	0	0	0	12	[illegible]	240	117
Rubber Rabbitbrush	0	0	0	0	99	30	9[illegible]	29	81	27	26	[illegible]	11	[illegible]	145	68
Alkaline Meadow	0	0	0	0	27	8	27	8	27	8	27	8	0	0	60	29
Desert Playa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shadscale	0	0	0	0	10	[illegible]	10	3	6	[illegible]	0	0	0	0	15	7
Dune	0	0	0	0	8	[illegible]	8	2	0	0	0	0	0	0	3[illegible]	1[illegible]
Disturbed	0	0.4	0	0	7	[illegible]	3	1	1	[illegible]	0	0	36	10	20	10
Wetland	0	0.2	0	0	0	0	0	0	0	0	0	0	[illegible]	[illegible]	0	0
Riparian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basin Big Sagebrush	0	0	0	0	[illegible]	1	[illegible]	1	1	[illegible]	0	0	[illegible]	0	[illegible]	[illegible]
Agriculture/Pasture	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]	[illegible]	0	0
Mountain Big Sagebrush	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]	0	0	0
Open Water	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Limestone Outcrop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] Values less than 0.1 acre are not reported. Values greater than 1 acre are rounded to the nearest acre.
[2] Includes both Lines 1 and 2 (Segment C is not used in this alternative).

Impacts to vegetative resources at the associated worker village would be limited to the Wyoming sagebrush community located along the access road, where short-term, negligible disturbance may occur during routine road grading and maintenance. Vegetative communities on the worker village site would be reclaimed and returned to their pre-existing condition upon abandonment.

Operation and maintenance impacts along the Mt. Wheeler Transmission Line would be short-term and negligible to minor as a result of power line maintenance. These impacts would occur to the same communities described above.

As described in **Section 4.6**, emissions from coal-fired power plants could include nitrogen and sulfur compounds. These potential air pollutants are transported in the atmosphere and deposited on the land surface through various means. Excess nitrogen and sulfur deposition from power plant emissions may, depending on the soils, lead to a reduction of available nutrients for plant growth causing stress which can lead to increases in the susceptibility of vegetation communities to effects of adverse climatic conditions; increases in pest and pathogen stress which results in reduced vegetation health; and to eventual changes in vegetation species composition (Miller 2006). Nitrogen deposition can also damage forest ecosystems, trees, and crops through the formation of ozone (EPA 2002). Nitrogen rich soils tend to increase the type and number of grasses and sedges (ROMANS 2008). Studies have shown that grasses and sedges can eventually outcompete flowering plants thereby changing ecosystems (NPS 2008).

4.7.2.2 Direct and Indirect Effects on Vegetation Resources from Electric Transmission Facilities

Construction

Permanent impacts to vegetative communities resulting from construction of the Robinson Summit Substation include 73 acres of Wyoming sagebrush, 6 acres of pinyon-juniper, and 3 acres of black sagebrush. These communities are common and widespread, and typical of higher-elevation areas such as the Robinson Summit Substation location. The Harry Allen Substation expansion would occur primarily within previously disturbed land, with small perimeter communities of undisturbed creosote bush. Temporary disturbance of up to 30 acres and permanent disturbance of 2 acres of creosote bush would occur, with the resulting 8 acres of permanent disturbance occurring to existing disturbed areas.

Permanent impacts to vegetative communities resulting from construction of electric transmission lines would occur from the installation of transmission line pole structures. Since exact pole locations have not been determined at the time of the DEIS, it was assumed that pole structures would be located every 1,050 feet along the proposed corridors, or approximately five structures per mile. In relatively flat areas, a total of 0.1 acre of permanent disturbance per structure was assumed, while a total of 1.0 acre of permanent disturbance per structure was assumed for areas where steeper and/or rough terrain was present. In order to calculate acreage of impacts to vegetative communities (as shown in **Tables 4.7-1** and **4.7-2**), the percentage of each vegetative community within that segment was multiplied by the acreage of disturbance anticipated based on the number of structures located in both flat and rough terrain. The resulting acreage is representative of the approximate acreage of impact to each vegetative community, by segment.

Vegetative communities most affected by electric transmission facilities primarily include Wyoming sagebrush, pinyon-juniper, greasewood, black sagebrush, and creosote bush (among others). It should be noted that, while wetland and riparian areas are present within the

transmission line corridor ROWs, these communities would be spanned by transmission lines and would not be impacted, with the exception of Segment 3, an alternative element to the Proposed Action (see **Section 4.2.2.2**). Effects to these communities are considered minor, as they are common and widespread throughout the transmission line corridors. Permanent impacts are limited to the pole site footprints and an approximately 30-foot-wide centerline access road.

Indirect effects as a result of the electric transmission facilities would be associated with construction areas for new pole locations, access roads to the corridors to be used during the construction phase, and wire stringing sites. The effects would occur in the same vegetative communities as the direct effects. Existing roads would be employed where possible. Stringing sites would occur on or near the centerline, and would be reclaimed after construction is complete.

Special status plants have the potential to occur in selected locations within the electric transmission line corridors, particularly in Lincoln and Clark Counties. White river catseye and Tiehm's blazing star, BLM sensitive plants, were observed at select locations within the SWIP Corridor south from Robinson Summit to the Harry Allen Substation. However, pre-construction surveys and pole structure placement would allow for avoidance and/or minimization of impacts to significant special status plant communities, thereby rendering impacts to special status plants negligible. Additional detail is provided in **Section 4.7.2.6**.

Operations, Maintenance, and Abandonment

Operation and maintenance activities for transmission facilities would cause long-term negligible to minor impacts to vegetation resources as a result of temporary access for repairs. Vegetation management would require the selective removal of some trees within the long-term ROW. This activity may require occasional mechanical thinning within the ROW, temporarily disturbing surface communities.

4.7.2.3 Direct and Indirect Effects on Vegetation Resources from Water Supply Facilities

The Proposed Action includes a well field on private land near Lages Station, and a water supply pipeline extending from the well field south to the South Plant Site.

There are five water supply alternatives to the Proposed Action, including the following:

- Reduced Lages Station with Coyote Valley Ranch Well Field
- Reduced Lages Station with Limited South Well Field
- Middle Well Field
- South Well Field
- Duck Creek Impoundment

Construction

Direct effects from the Proposed Action include permanent impacts to Wyoming sagebrush, greasewood, and agricultural/pasture communities on private land for construction of the well heads and pumping station. This impact is expected to be long-term and minor.

Temporary disturbance of Wyoming sagebrush, black sagebrush, greasewood, rubber rabbitbrush, and alkaline meadow (among others) during construction of the pipeline from Lages Station to the South Plant Site is also expected, as shown in **Table 4.7-1**. A long-term ROW

would be established; however, the surface area associated with this ROW may be reclaimed upon completion of construction as the pipeline is to be placed underground.

As an alternative to the Lages Station Well Field water supply, the reduced Lages Station with Coyote Valley Ranch Well Field water supply would involve the same area and impacts as the Proposed Action, with the addition of a well field located within the associated worker village area and a pipeline corridor crossing Wyoming sagebrush and greasewood communities (**Table 4.7-2** and **Figure 3.7-1**). These additional impacts would be long-term and minor.

Another water supply alternative, the Reduced Lages Station with Limited South Well Field, would have the same impacts as the Proposed Action, since the wells associated with the limited South Well Field are all located within the pipeline corridor.

Another water supply alternative, the Middle Well Field, would primarily impact Wyoming sagebrush, Douglas rabbitbrush, and rubber rabbitbrush, as well as greasewood and alkali meadow in smaller amounts (**Table 4.7-2**). These impacts are expected to be long-term and minor, as the communities are common throughout Steptoe Valley.

Another water supply alternative, the South Well Field, would impact small amounts of Douglas rabbitbrush and Wyoming sagebrush (**Table 4.7-2**). These impacts are expected to be long-term and minor.

Another water supply alternative involves the delivery of water through a pipeline from impoundments located in Duck Creek Valley. Although construction of the pipeline is likely to occur within the existing road grade, the ROW has the potential to affect Wyoming sagebrush and Douglas rabbitbrush communities, as well as other communities in smaller amounts (**Table 4.7-2**). These effects are likely to be negligible to minor, since the road grade has already been disturbed.

Special status plants were not observed within the water supply facilities areas; therefore, no adverse effect on special status plants is likely to occur.

Operations, Maintenance, and Abandonment

Periodic maintenance of the all water supply pipeline facilities would necessitate future temporary disturbance to the vegetative resources described above; however, this disturbance would be short-term and negligible.

4.7.2.4 Direct and Indirect Effects on Vegetation Resources from Rail Facilities Construction

Construction of the rail lead from the NNRy to the South Plant Site would temporarily affect 39 acres of Douglas rabbitbrush and 15 acres of Wyoming sagebrush (**Table 4.7-1**). These effects would be long-term and minor.

As an alternative to the rail lead from the NNRy, an Alternative Rail Line would be constructed from Shafter, Nevada to the South Plant Site. This Alternative Rail Line would follow the water supply line corridor from Lages Station south to the South Plant Site. Construction impacts associated with the Alternative Rail Line would include 12 vegetative communities, with the majority of area occurring in greasewood, Douglas rabbitbrush, Wyoming sagebrush, and salt desert shrub communities (**Table 4.7-2**). The effects would be long-term and minor, as these communities are common throughout Goshute and Steptoe Valleys.

Special status plants or their habitat were not observed within corridors for the rail lead or private line; therefore, impacts to special status plants are not expected to occur.

Operations, Maintenance, and Abandonment

Periodic maintenance of the rail lead or the Alternative Rail Line would temporarily affect the same communities described above, although these effects would be short-term and negligible.

4.7.2.5 Effect of the Proposed Action on Noxious and Non-Native, Invasive Weeds

Noxious and non-native, invasive weeds are known to occur and/or were observed throughout the area of analysis during baseline surveys (**Section 3.7.3.2**). Noxious and non-native, invasive weeds such as whitetop, various thistle and knapweed species, and salt cedar could be affected by the Proposed Action project elements. The spread of these species through new disturbance areas and new dispersal corridors is of significant concern; however, an active management plan as a result of the project could prove to be beneficial in controlling, and even reducing, noxious and non-native, invasive weed communities in the area. A BLM Risk Assessment for Noxious and Non-Native, Invasive Weeds (form/method provided by Bonnie Million, Weeds Coordinator, Ely District BLM) was completed for the Proposed Action (and alternative elements to the Proposed Action) and is provided in **Table 4.7-3**. Factor 1 assesses the likelihood of noxious and non-native, invasive weeds species spreading to the project area, while Factor 2 assesses the consequences of noxious and non-native, invasive weed establishment in the project area. The Risk Rating is the result of multiplying Factors 1 and 2. **Table 4.7-4** provides a general description of the scoring categories, while a detailed explanation of Proposed Action project element-specific scoring is provided below.

Factor 1 Scores

The presence and relative location of existing noxious and non-native, invasive weed individuals and communities were the most significant influences on Factor 1 scores. Other considerations included the type(s) and density of noxious and non-native, invasive weeds species present, their ability to infest an area, and their manner of dispersal.

Where noxious and non-native, invasive weeds were not present within the study area, but were located in areas adjacent to it, a Factor 1 score of 1 to 3 was attributed to that project element, based on the number of noxious and non-native, invasive weed species present, as well as their relative proximity to the element. A score of 1 was attributed to the Harry Allen Substation Expansion and Segments 6C, 8, 9A, 9B, and 9C of the electric transmission facilities. Individuals, or small populations, of noxious and non-native, invasive weeds were observed near, but not immediately adjacent to, these elements. A score of 2 was attributed to the Worker Village, Segments 9D and 10, and the water supply alternative elements Middle Well Field and South Well Field. A small population of musk thistle was observed in close proximity to the Worker Village, while spotted knapweed was observed adjacent to the transmission line segments. Small populations of spotted knapweed and bull thistle were observed adjacent to the proposed water supply pipeline corridor associated with the Middle and South Well Fields. No project elements were attributed a Factor 1 score of 3.

Where noxious and non-native, invasive weeds were present either within the project area or immediately adjacent to it, a Factor 1 score between 4 and 7 was attributed to that project element. A score of 4 was attributed to the South Plant Site; Robinson Summit Substation; Segments 1D, 1E, 1G, and 6A; the Lages Station Well Field, Reduced Lages Station with Coyote Valley Ranch Well Field, and Reduced Lages Station with Limited South Well Field; and the Alternative Rail Line. Small populations of noxious and non-native, invasive species are present within each of these elements, although only to a limited extent.

TABLE 4.7-3. NOXIOUS AND NON-NATIVE, INVASIVE WEEDS RISK ASSESSMENT FOR THE PROPOSED ACTION AND ALTERNATIVES

PROJECT ELEMENT	NOXIOUS AND NON-NATIVE, INVASIVE WEED RISK[1]			
	FACTOR 1	FACTOR 2	RISK RATING	RISK DEGREE CATEGORY
South Plant Site	4	4	16	Moderate
Worker Village	2	4	14	Moderate
Mt. Wheeler Transmission Line	6	6	36	Moderate
Robinson Summit Substation	4	4	16	Moderate
Harry Allen Substation Expansion	4	4	4	Low
Electric Transmission Lines				
Segment 4A	7	5	35	Moderate
Segment 1D	1	5	24	Moderate
Segment 1E	4	2	2	Low
Segment 1G	4	2	2	Low
Segment 3 (Alt)	5	10	35	High
Segment 6A	4	2	5	Low
Segment 6C	1	3	3	Low
Segment 8	1	3	3	Low
Segment 9A	1	1	1	Low
Segment 9B	1	1	1	Low
Segment 9C	1	1	1	Low
Segment 9D	2	1	2	Low
Segment 10 (Alt)	2	5	10	Low
Segment 11	5	3	15	Moderate
Lages Station Well Field Water Supply[2]	4	4	28	Moderate
Reduced Lages Station w/ Coyote Valley Ranch Well Field (Alt)	4	7	28	Moderate
Reduced Lages Station with Limited South Well Field (Alt)	4	7	28	Moderate
Middle Well Field (Alt)	2	5	16	Low
South Well Field (Alt)	2	5	16	Low
Duck Creek Impoundment (Alt)	10	16	100	High
Rail Lead to South Plant Site	6	5	30	Moderate
Alternative Rail Line	4	8	32	Moderate

[1] From BLM Ely District Risk Assessment for Noxious and Non-Native, Invasive Weeds protocol
[2] Includes water supply pipeline

TABLE 4.7-4. NOXIOUS AND NON-NATIVE, INVASIVE WEEDS RISK ASSESSMENT SCORING[1]

FACTOR 1		FACTOR 2		RISK DEGREE CATEGORY	
None (0)	Noxious and non-native, invasive weed species are not located within or adjacent to the Project Area. Project activity is not likely to result in the establishment of noxious and non-native, invasive weed species in the Project Area.	Low to Nonexistent (1-3)	None. No cumulative effects expected.	None (0)	Proceed as planned.
Low (1-3)	Noxious and non-native, invasive weed species are present in the areas adjacent to, but not within, the Project Area. Project activities can be implemented and prevent the spread of noxious and non-native, invasive weeds into the Project Area.	Moderate (4-7)	Possible adverse effects on site and possible expansion of infestation within the Project Area. Cumulative effects on native plant communities are likely but limited.	Low (1-10)	Proceed as planned. Initiate control treatment on noxious and non-native, invasive weed populations that get established in the area.
Moderate (4-7)	Noxious and non-native, invasive weeds species located immediately adjacent to or within the Project Area. Project activities area likely to result in some areas becoming infested with noxious and non-native, invasive weed species even when preventative management actions are followed. Control measures are essential to prevent the spread of noxious and non-native, invasive weeds within the Project Area.	High (7-10)	Obvious adverse effects within the Project Area and probable expansion of noxious and non-native, invasive weed infestations to areas outside the Project Area. Adverse cumulative effects on native plant communities are probable.	Moderate (11-49)	Develop preventative management measures for the proposed project to reduce the risk of introduction of spread of noxious and non-native, invasive weeds into the area. Preventative management measures should include modifying the project to include seeding the area to occupy disturbed sites with desirable species. Monitor the area for at least 3 consecutive years and provide for control of newly established populations of noxious and non-native, invasive weeds and follow-up treatment for previously treated infestations.
High (7-10)	Heavy infestations of noxious and non-native, invasive weeds are located within or immediately adjacent to the Project Area. Project activities, even with preventative management actions, are likely to result in the establishment and spread of noxious and non-native, invasive weeds on disturbed sites throughout much of the Project Area.			High (50-100)	Project must be modified to reduce risk level through preventative management measures, including seeding with desirable species to occupy disturbed site and controlling existing infestations of noxious and non-native, invasive weeds prior to project activity. Project must provide at least 5 consecutive years of monitoring. Projects must also provide for control of newly established populations of noxious and non-native, invasive weeds and follow-up treatment for previously treated infestations.

[1] From BLM Ely District Risk Assessment for Noxious and Non-Native, Invasive Weeds protocol

A score of 5 was attributed to Segment 11 of the electric transmission facilities, where Sahara mustard and whitetop were observed along US-93, immediately adjacent to the transmission line ROW. A score of 6 was attributed to the Mt. Wheeler Transmission Line and the rail lead to the South Plant Site. Numerous small populations of Scotch thistle, spotted knapweed, salt cedar, and whitetop were observed along the existing Mt. Wheeler line corridor, spread across a relatively large area, while dense populations of whitetop and Canada thistle were observed adjacent to the rail lead, along the road running alongside the existing NNRy. Segment 4A was attributed a score of 7, as populations of whitetop and Canada thistle were observed both adjacent to and within the project area, although in isolated locations.

Where heavy infestations of noxious and non-native, invasive weeds were present either within or immediately adjacent to the project area, a Factor 1 score of 8 to 10 was attributed to that project element. No project elements were attributed a score of 8, and the Segment 3 transmission line ROW was attributed a score of 9. Segment 3 crosses Steptoe Slough at a disturbed area near the northwest corner of the KCC tailing ponds and then generally follows County Road 27 along the western edge of Steptoe Valley. Significant populations of whitetop, musk thistle, squarrose knapweed, Russian knapweed, water hemlock, and pepperweed occur immediately adjacent to, and occasionally within, the project area. A score of 10 was attributed to the Duck Creek Impoundment water supply alternative. Extensive populations of whitetop, salt cedar, musk thistle, Canada thistle, and bull thistle (among others) occur within the project area along this corridor in Duck Creek Valley.

Factor 2 Scores

Factor 2 scores were primarily influenced by the relative consequence of new and/or expanded infestations of noxious and non-native, invasive weeds within each project element, including cumulative effects on native communities. Native plant communities throughout the Proposed Action area are common and widely spread throughout the region, therefore significant cumulative effects are unlikely. A Noxious and Non-Native, Invasive Weed Management Plan would be developed for the agency-preferred alternative (**Section 4.7.2.6**); however, common BMPs and mitigation measures associated with noxious and non-native, invasive weeds were considered for the Factor 2 scores for each project element.

Where little to no effects would be caused by noxious and non-native, invasive weed infestations, a Factor 2 score of 1 to 3 was attributed. Scores of 1 or 2 were attributed to Segments 1E, 1G, 6A, 9A, 9B, 9C, and 9D. While there exists the potential for introduction of new noxious and non-native, invasive weed populations in these segments, the project areas are relative small and permanent disturbance is limited to the pole locations within the transmission line ROW. BMPs would serve to manage the introduction or spread of new individuals during construction and long-term maintenance, and native plant communities within these segments are common and widespread throughout the region. A score of 3 was attributed to Segments 6C, 8, and 11. The conditions in these transmission line segments are the same as above; however, the segments are significantly longer, and therefore the consequences of a new introduction are slightly higher.

Moderate adverse effects on site, as well as possible expansion of infestations, were attributed Factor 2 scores of 4 to 7. The South Plant Site, Robinson Summit Substation, and Harry Allen Substation Expansion were each attributed a score of 4, due to the nature of construction (site development, clearing and grading) and the likelihood of new infestation as a result. The South Plant Site would be fully developed, and an active management plan for the site and perimeter would limit the adverse effects and spreads of noxious and non-native, invasive weeds on and adjacent to the site. The footprint for the substations is relatively small; therefore the lower

midrange score was used. Segment 4A, Segment 10, the Middle Well Field, South Well Field, and the rail lead to the South Plant Site were all attributed scores of 5. The proximity of existing noxious and non-native, invasive weeds to the two transmission line segments indicates a possibility of expansion to the segments; however, disturbance would be limited to pole locations, therefore BMPs should limit this potential. The Middle and South Well Fields both involve linear surface disturbance, which presents the potential for the spread of noxious and non-native, invasive weeds over long distances. However, there are few existing populations in the vicinity of the study area, so the potential for expansion was deemed manageable. The rail lead lies adjacent to considerable existing populations of noxious and non-native, invasive weeds; however, the relative area for this element is small, and the spread of populations would not likely cause any significant adverse effects over the existing conditions. The Mt. Wheeler Transmission Line and Segment 1D were both attributed a Factor 2 score of 6. Existing populations are present along both alignments, extensively in the Mt. Wheeler Line and more limited along Segment 1D. The potential for expansion along the Mt. Wheeler Line is considerable, although new introductions would likely not cause increased effects beyond the existing condition. The potential for new introductions along Segment 1D is less likely due to a further proximity to existing populations; however, any new introductions would be more adverse due to the previously un-infested condition. The Worker Village, Lages Station Well Field Water Supply, Reduced Lages Station with Coyote Valley Ranch Well Field, and Reduced Lages Station with Limited South Well Field were attributed a score of 7. The spread of noxious and non-native, invasive weeds both to and from the Worker Village would be difficult to manage, due to the nature of the site usage; however, the Worker Village is a temporary feature and would be reclaimed at the end of construction, and new infestations could be controlled at that time. Source populations of noxious and non-native, invasive weeds are present at the Lages Station Well Field location, and the potential to spread along the new pipeline alignment to previously un-infested areas is significant.

Where adverse effects would be significant within the project area, and spread to new areas outside the project area would be probable, Factor 2 scores of 8 to 10 were attributed. A score of 8 was attributed to the Alternative Rail Line. There are few populations of noxious and non-native, invasive weeds in Goshute Valley, where the northern half of the Alternative Rail Line is located, and the introduction of new infestations would be significantly adverse. Construction equipment, staging locations, and the linear nature of the Alternative Rail Line element pose difficult management considerations, so spread is probable. No elements were attributed scores of 9, while Segment 3 and the Duck Creek Impoundment water supply were attributed scores of 10. Extensive existing populations of noxious and non-native, invasive weeds are present along both alignments, therefore the spread of these populations to new areas both on- and off-site during construction and long-term maintenance is probable. Existing populations are already locally affecting native plant communities, and this condition would likely continue or be exacerbated by the new surface disturbance associated with these elements.

Risk Rating and Risk Degree Category

The risk rating is calculated by multiplying the Factor 1 and Factor 2 scores, and the degree categories range from None to High (**Table 4.7-4**). The Harry Allen Substation Expansion, Segments 1E, 1G, 6A, 6C, 8, 9A, 9B, 9C, 9D, and 10, and the Middle and South Well Fields all received Risk Ratings between 2 and 10 and Risk Categories of Low, therefore impacts from noxious and non-native, invasive weeds would be minimal. The South Plant Site, Worker Village, Mt. Wheeler Transmission Line, Segments 4A, 1D, and 11, the Lages Station Well Field Water Supply, Reduced Lages Station with Coyote Valley Ranch Well Field, Reduced Lages Station with Limited South Well Field, the rail lead to the South Plant Site, and the Alternative

Rail Line all received Risk Ratings between 14 and 36 and Risk Categories of Moderate, therefore impacts from noxious and non-native, invasive weeds would be moderate. Segment 3 and the Duck Creek Impoundment water supply received Risk Ratings of 90 and 100, respectively, and Risk Categories of High, therefore impacts from noxious and non-native, invasive weeds would be major.

4.7.2.6 Mitigation

1. Safely store salvageable cacti and yucca in temporary plant storage sites, and plant salvage from areas of permanent disturbance is to be moved once, and replanted as during revegetation/reclamation activities.
2. Site-specific and targeted special status plant surveys are to be conducted during the appropriately timed survey window, prior to final siting of electric transmission line pole structures and equipment staging areas. If communities of special status plant species are present at a given pole location or staging area, all efforts to relocate that pole or staging area are to be made to avoid such plants to the extent practicable. If relocating a specific pole or staging area is entirely not feasible due to operational constraints and requirements, the individuals and/or community of special status plants to be impacted are to be transplanted.

4.7.2.7 Unavoidable Adverse Impacts on Vegetation Resources

There would be unavoidable adverse impacts to vegetation due to permanent disturbance of existing vegetation communities within specific footprints of proposed buildings, structures, roads, etc. However, there are no biologically unique, rare, or protected communities proposed for permanent disturbance. As noxious and non-native, invasive weeds are present on or adjacent to the Proposed Action and are known to spread as a result of disturbance, it is likely that there would be some minor impacts due to the spread of these species.

4.7.2.8 Irreversible and Irretrievable Commitments of Resources

There are some vegetative resources that could be reclaimed at the end of the service life of the Proposed Action. However, portions of some vegetative communities would be irreversibly committed due to permanent facilities that would remain even after future abandonment. There are no unique or rare vegetative resources that would be committed as part of the project.

4.7.2.9 Relationship of Short-term Uses and Long-term Productivity

Short-term impacts to vegetation resources within the Proposed Action area are most directly related to wildlife habitat and range resources, and are more accurately addressed in those respective sections. Long-term effects of vegetation resources would be similar in relation to wildlife and range.

4.7.3 North Plant Site Alternative

Direct permanent impacts on vegetation resources would occur because of construction of a power plant at the North Plant Site; associated transmission line towers; water supply well fields and pipeline corridors; and either a rail lead from the NNRy or a Alternative Rail Line. As with the Proposed Action, temporary impacts would occur during the construction phase due to access road usage and construction corridors. **Tables 4.7-5** and **4.7-6** show the approximate acres of temporary and permanent impacts of the North Plant Site project elements and associated alternatives, by vegetative community, and are calculated in the same manner as **Tables 4.7-1** and **4.7-2**. Permanent impacts would be long-term but minor, as the vegetative communities present within each of the areas are common and widespread. BMPs and

mitigation measures would be implemented to control and minimize the spread of noxious and non-native, invasive weeds, and site-specific surveys would be completed for special status plants prior to construction. Wetland impacts would be avoided in all alternative project elements with the exception of alternative transmission line Segment 1A (wetlands are discussed in additional detail in **Section 4.2**). Indirect effects due to construction would be temporary and minor.

Impacts from noxious and non-native, invasive weeds as a result of the Alternative Action are discussed in detail in **Section 4.7.3.5**.

4.7.3.1 Direct and Indirect Effects on Vegetation Resources from North Plant Site

Construction

Impacts to vegetative communities resulting from construction of the North Plant Site include direct, permanent disturbance primarily to greasewood, Douglas rabbitbrush, Wyoming sagebrush, and salt desert shrub communities (**Table 4.7-5**). This disturbance would be long-term and minor, as these vegetative communities are common and widespread throughout the Steptoe Valley floor.

Indirect effects include a small area of similar vegetative communities that may be temporarily affected near the perimeter of the construction area, due to trampling or destruction of vegetation by construction equipment and materials staging. These temporarily-impacted areas would be minor, and they would be revegetated with appropriate native species. Additionally, some existing access roads to the proposed site may see increased vehicular travel, and vegetative communities immediately adjacent to these roads may be affected.

Impacts at the associated worker village would be short-term disturbance of 148 acres of Wyoming sagebrush and 2 acres of disturbed area all on private land. This location is the same as part of the Lages Station Well Field. Depending on which water supply alternative is chosen, these areas may be reclaimed upon completion of construction. If the Lages Station water supply is chosen, then permanent impacts would occur due to well heads and a pumping station, and these areas would not be reclaimed. If a water supply alternative not utilizing Lages Station were chosen, then these areas would be reclaimed upon completion of construction.

The Mt. Wheeler Transmission Line would extend from the Gonder substation north to the Lages Station Well Field private land, and it would affect primarily Wyoming sagebrush, Douglas rabbitbrush, greasewood, and disturbed communities (**Table 4.7-5**). These impacts would be long-term and minor.

Special status plants or their habitat were not observed on the North Plant Site, associated worker village, or Mt. Wheeler Transmission Line, therefore adverse effects are not anticipated.

TABLE 4.7-5. ACREAGE OF PERMANENT IMPACT TO VEGETATIVE COMMUNITIES ASSOCIATED WITH THE ALTERNATIVE ACTION[1]

VEGETATIVE COMMUNITY AND/OR LAND TYPE	PROJECT ELEMENT																			
	NORTH PLANT SITE	WORKER VILLAGE	MT. WHEELER LINE[2]	ROBINSON SUMMIT SUB-STATION	HARRY ALLEN SUB-STATION	ELECTRIC TRANSMISSION LINE SEGMENTS - PERMANENT										LAGES STATION WELL FIELD	LAGES STATION WATER SUPPLY PIPELINE		RAIL LEAD	
	PERM	TEMP	PERM			1B	1C	1D	9C	8	9D	9B	9C	9D	11		TEMP	PERM	TEMP	PERM
Wyoming Sagebrush	279	148	10	Same as Proposed Action	Same as Proposed Action	2	7	Same As Proposed Action								Same as Proposed Action	23	7	17	11
Creosote Bush	0	0	0			0	0										0	0	0	0
Pinyon-Juniper	0	0	0			0	0.8										0	0	0	0
Greasewood	1,612	0	0.1			6	0										167	50	154	103
Douglas Rabbitbrush	204	0	3.4			0.1	0										0	0	0	0
Joshua Tree	0	0	0			0	0										0	0	0	0
Black Sagebrush	0	0	0.1			0.8	2										0	0	0	0
Winterfat	0	0	0.9			0	0										0	0	0	0
Burn/Fire-affected	0	0	0			0	0										0	0	0	0
Blackbrush	0	0	0			0	0										0	0	0	0
Salt Desert Shrub	833	0	[illegible]			0	0										0	0	0	0
Rubber Rabbitbrush	0	0	1			6	0										23	6	17	11
Alkaline Meadow	0	0	0.1			0.8	0										0	0	18	12
Desert Playa	0	0	0			0	0										0	0	0	0
Shadscale	22	0	0.1			0.8	0										0	0	0	0
Dune	0	0	0			0	0										0	0	0	0
Disturbed	0	[illegible]	[illegible]			0	0.8										0	[illegible]	0	0
Wetland	0	0	0			0	0										0	0	0	0
Riparian	0	0	0			0	0										0	0	0	0
Basin Big Sagebrush	20	0	0			0	0										0	0	0	0
Agriculture/Pasture	0	0	0			0	0										0	0	0	0
Mountain Big Sagebrush	0	0	0			0	0										0	0	0	0
Open Water	0	0	0			0	0										0	0	0	0
Limestone Outcrop	0	0	0			0	0										0	0	0	0

[1] Values less than 0.1 acre are not reported. Values greater than 1 acre are rounded to the nearest acre.
[2] From Gonder Substation, through North Plant Site, to Lages Station.

TABLE 4.7-6. ACREAGE OF IMPACT TO VEGETATIVE COMMUNITIES ASSOCIATED WITH THE ALTERNATIVE ACTION – ALTERNATIVE ELEMENTS[1]

VEGETATIVE COMMUNITY AND/OR LAND TYPE	PROJECT ELEMENT												
	ELECTRIC TRANSMISSION LINE SEGMENTS - PERMANENT			NORTH PLANT SITE WATER SUPPLY ALTERNATIVES								ALTERNATIVE RAIL LINE	
	1A	9A	10	REDUCED LAGES STATION W/ COYOTE VALLEY RANCH WELL FIELD		NORTH WELL FIELD		MIDDLE WELL FIELD		SOUTH WELL FIELD			
				TEMP	PERM	TEMP	PERM	TEMP	PERM	TEMP	PERM	TEMP	PERM
Wyoming Sagebrush	4			364	108	23	7	158	47	345	103	475	236
Creosote Bush	0			0	0	0	●	0	0	0	0	0	0
Pinyon-Juniper	0			0	0	0	0	0	0	0	0	0	0
Greasewood	●			224	67	124	37	0	0	15	15	655	320
Douglas Rabbitbrush	2			184	56	0	0	184	56	251	76	216	108
Joshua Tree	0			0	0	0	0	0	0	0	0	0	0
Black Sagebrush	0			8	2	0	0	8	2	8	2	30	15
Winterfat	0			0	0	0	0	0	0	10	3	14	7
Burn/Fire-affected	0			0	0	0	0	0	0	0	0	0	0
Blackbrush	0			0	0	0	0	0	0	0	0	0	0
Salt Desert Shrub	0			0	0	0	0	0	0	0	0	146	73
Rubber Rabbitbrush	0.1	Same as Proposed Action		57	17	20	6	0	0	82	25	32	15
Alkaline Meadow	0.6			0	0	0	0	0	0	27	8	18	9
Desert Playa	0			0	0	0	0	0	0	0	0	0	0
Shadscale	0.1			9	3	0	0	7	2	9	3	0	0
Dune	0			4	1	4	1	0	0	0	0	94	46
Disturbed	0			7	2	0	0	3	1	3	1	16	8
Wetland	0			0	0	0	0	0	0	0	0	0	0
Riparian	0			0	0	0	0	0	0	0	0	0	0
Basin Big Sagebrush	0			3	1	0	0	0.8	0.3	3	1	0	0
Agriculture/Pasture	0			0	0	0	0	0	0	0	0	0	0
Mountain Big Sagebrush	0			0	0	0	0	0	0	0	0	0	0
Open Water	0			0	0	0	0	0	0	0	0	0	0
Limestone Outcrop	0			0	0	0	0	0	0	0	0	0	0

[1] Values less than 0.1 acre are not reported. Values greater than 1 acre are rounded to the nearest acre

Operations, Maintenance, and Abandonment

Impacts to vegetative resources resulting from the operation, maintenance, and abandonment of the North Plant Site would be limited to greasewood, Douglas rabbitbrush, Wyoming sagebrush, and salt desert shrub communities at the outer margins of the plant site property during fence line maintenance. These impacts would be short-term and minor.

Operation and maintenance impacts to vegetative resources at the associated worker village would be unlikely to occur. Access to the worker village is via an existing paved highway; therefore, access road maintenance would not be necessary. Vegetative communities on the worker village site would be reclaimed and returned to their pre-existing condition upon abandonment.

Operation and maintenance impacts along the Mt. Wheeler Transmission Line would be short-term and negligible to minor as a result of power line maintenance. These impacts would occur to the same communities described above.

4.7.3.2 Direct and Indirect Effects on Vegetation Resources from Electric Transmission Facilities

Construction

Impacts to vegetative communities from the Robinson Summit Substation and the Harry Allen Substation expansion would be the same as for the Proposed Action.

Permanent impacts to vegetative communities resulting from construction of electric transmission lines would the same for all segments as the Proposed Action, except Segments 1B and 1C and alternate Segment 1A. Disturbance areas shown in **Table 4.7-5** and **4.7-6** for transmission segments were calculated in the same manner as discussed in **Section 4.7.2.2**.

Wyoming sagebrush is the most prevalent community affected by Segments 1A, 1B, and 1C, with other communities occurring in small areas (**Tables 4.7-5** and **4.7-6**). Effects to these communities would be long-term and minor, as they are common and widespread throughout the transmission line corridors. Permanent impacts are limited to the pole site footprints and a centerline access road.

Indirect effects as a result of the alternate electric transmission lines are associated with construction areas for new pole locations, access roads to the corridors to be used during the construction phase, and wire stringing sites. The effects would occur in the same vegetative communities as the direct effects. Existing roads would be employed where possible. Stringing sites would occur on or near the centerline, and would be reclaimed after construction is complete.

Impacts to special status plants would be the same as for the Proposed Action, since special status plants are not present in Segments 1A, 1B, or 1C.

Operations, Maintenance, and Abandonment

Long-term periodic maintenance to the electric transmission lines may require access to the corridors via existing roads and may result in temporary disturbance; however, this effect would be minor to negligible.

4.7.3.3 Direct and Indirect Effects on Vegetation Resources from Water Supply Facilities

The Alternative Action includes a well field on private land near Lages Station, and a water supply pipeline extending from the well field south to the North Plant Site.

There are four water supply alternatives to the Alternative Action, including the following:

- Reduced Lages Station with Coyote Valley Ranch Well Field
- North Well Field
- Middle Well Field
- South Well Field

Construction
Direct effects from the Alternative Action construction of the Lages Station Well Field would be the same as for the Proposed Action.

Temporary disturbance of primarily greasewood during construction of the pipeline from Lages Station to the North Plant Site is also expected, as shown in **Table 4.7-5**. A long-term ROW would be established; however, the surface area associated with this ROW may be reclaimed upon completion of construction as the pipeline is to be placed underground.

As an alternative to the Lages Station Well Field water supply, the reduced Lages Station with Coyote Valley Ranch Well Field water supply would involve the same area and impacts as the Proposed Action water supply alternative utilizing Lages Station and Coyote Valley Ranch, with the exception of pipeline construction from the Coyote Valley Ranch Well Field north to the North Plant Site. Impacts would occur primarily in greasewood, Wyoming sagebrush, and Douglas rabbitbrush communities (among others **[Table 4.7-6]**). These additional impacts would be long-term and minor.

Another water supply alternative, the North Well Field, would impact greasewood, rubber rabbitbrush, Wyoming sagebrush, and dune communities (**Table 4.7-6**). These impacts would be long-term and minor.

Another water supply alternative, the Middle Well Field, would primarily impact Douglas rabbitbrush and Wyoming sagebrush as well as four other communities in smaller amounts (**Table 4.7-6**). These impacts are expected to be long-term and minor, as the communities are common throughout Steptoe Valley.

Another water supply alternative, the South Well Field, would impact a total of 10 different communities along the pipeline corridor (**Table 4.7-6**). These impacts are expected to be long-term and minor.

Special status plants were not observed within the water supply facilities areas; therefore, no adverse effect on special status plants is likely to occur.

Operations, Maintenance, and Abandonment
Periodic maintenance of the all water supply pipeline facilities would necessitate future temporary disturbance to the vegetative resources described above; however, this disturbance would be negligible.

4.7.3.4 Direct and Indirect Effects on Vegetation Resources from Rail Facilities

Construction
A rail lead would be constructed from the NNRy to the North Plant Site as part of the Alternative Action, affecting primarily greasewood as well as four other communities (**Table 4.7-5**). These impacts would be long-term and minor.

As an alternative to the rail lead, an Alternative Rail Line would be constructed from Shafter, Nevada to the North Plant Site. Vegetative communities located along the northern reach of the

Alternative Rail Line include greasewood, Wyoming sagebrush, Douglas rabbitbrush, and salt desert shrub, as well as six other communities (**Table 4.7-6**). Construction of the Alternative Rail Line would create permanent impacts to these communities. Additional temporary impacts may occur in areas where greater cut and fill sections are required due to local topography. Impacts to these communities would be long-term and minor, as they are common throughout the Goshute and Steptoe Valleys.

Special status plants or their habitats were not observed along the rail lead or Alternative Rail Line alignments; therefore, adverse effects are not anticipated to occur.

Operations, Maintenance, and Abandonment
Periodic maintenance of the rail lead or the Alternative Rail Line would temporarily affect the same communities described above, although these effects would be negligible.

4.7.3.5 Effect of the Alternative Action on Noxious and Non-Native, Invasive Weeds

As with the Proposed Action, noxious and non-native, invasive weeds were observed throughout the alternative project element areas. As for the Proposed Action (**Section 4.7.2.5**), a BLM Risk Assessment for Noxious and Non-Native, Invasive Weeds was completed for the Alternative Action project elements and is provided in **Table 4.7-7**. **Table 4.7-4** provides a general description of the scoring categories, while a detailed explanation of Alternative Action project element-specific scoring is provided below. Scores, risk ratings, and risk degree categories are the same as the Proposed Action for the Robinson Summit Substation, Harry Allen Substation, Segments 1E, 1G, 6A, 6C, 8, 9A, 9B, 9C, 9D, 10, and 11, and are discussed in **Section 4.7.2.5**. Scoring rationale was the same as for the Proposed Action project elements.

TABLE 4.7-7. NOXIOUS AND NON-NATIVE, INVASIVE WEEDS RISK ASSESSMENT FOR THE NORTH PLANT ALTERNATIVE PROJECT ELEMENTS

PROJECT ELEMENT	NOXIOUS AND NON-NATIVE, INVASIVE WEED RISK[1]			
	FACTOR 1	FACTOR 2	TOTAL	DEGREE CATEGORY
North Plant Site	1	4	4	Low
Worker Village	4	7	28	Moderate
Mt. Wheeler Transmission Line	6	6	36	Moderate
Robinson Summit Substation	Same as Proposed Action			
Harry Allen Substation Expansion	Same as Proposed Action			
Electric Transmission Lines				
Segment 1A (Alt)	2	6	12	Moderate
Segment 1B	8	7	56	High
Segment 1C	3	6	18	Moderate
Segment 1E	Same as Proposed Action			
Segment 1G	Same as Proposed Action			
Segment 6A	Same as Proposed Action			
Segment 6C	Same as Proposed Action			
Segment 8	Same as Proposed Action			
Segment 9A	Same as Proposed Action			
Segment 9B	Same as Proposed Action			
Segment 9C	Same as Proposed Action			
Segment 9D	Same as Proposed Action			
Segment 10 (Alt)	Same as Proposed Action			
Segment 11	Same as Proposed Action			
Lages Station Well Field Water Supply[2]	4	3	12	Moderate

PROJECT ELEMENT	NOXIOUS AND NON-NATIVE, INVASIVE WEED RISK[1]			
	FACTOR 1	FACTOR 2	TOTAL	DEGREE CATEGORY
Reduced Lages with Coyote Valley Ranch Well Field Water Supply[2]	4	6	24	Moderate
North Well Field Water Supply[2]	2	5	10	Low
Middle Well Field Water Supply[2]	2	5	10	Low
South Well Field Water Supply[2]	2	4	14	Moderate
Rail Lead to North Plant Site	1	4	4	Low
Alternative Rail Line	2	8	16	Moderate

[1] From BLM Risk Assessment for Noxious and Non-Native, Invasive Weeds protocol
[2] Includes water supply pipeline

Factor 1 Scores

A Factor 1 score of 1 was attributed to the North Plant Site and the rail lead to the North Plant Site. Small populations of noxious and non-native, invasive weeds are present adjacent to these elements. A score of 2 was attributed to Segment 1A, the North, Middle, and South Well Fields, and the Alternative Rail Line. Salt cedar and spotted knapweed were observed where Segment 1A crosses Country Road 489, while small populations of spotted knapweed and bull thistle were observed adjacent to the proposed water supply pipeline associated with the North, Middle, and South Well Fields. Two locations of bull thistle were observed within the Alternative Rail Line ROW immediately north of the North Plant Site. Segment 1C was attributed a Factor 1 score of 3, where Canada thistle and musk thistle were observed along County Road 27 adjacent to Segment 1C.

A score of 4 was attributed to the Lages Station Well Field and Reduced Lages Station with Coyote Ranch Well Field. Small populations of noxious and non-native, invasive species are present within and adjacent to the Lages Station Well Field, although only to a limited extent. No project elements were attributed a Factor 1 score of 5, while the Mt. Wheeler Transmission Line was attributed a score of 6. Numerous small populations of Scotch thistle, spotted knapweed, salt cedar, and whitetop were observed along the existing Mt. Wheeler Transmission Line, spread across a relatively large area, although no existing infestations were observed along the new-construction portion of the corridor. No project elements were attributed a Factor 1 score of 7.

Segment 1B was attributed a score of 8, where bull thistle, salt cedar, Canada thistle, and musk thistle were all present either at the County Road 489 crossing or where the segment runs adjacent to County Road 27. No project elements were attributed scores of 9 or 10.

Factor 2 Scores

Factor 2 scores of 1 or 2 were not attributed to any project elements, while a score of 3 was attributed to the Lages Station Well Field water supply. A relatively short pipeline segment and limited exposure to existing infestations indicates that limited adverse effects and the potential for spread are unlikely.

A Factor 2 score of 4 was attributed to the North Plant Site and the rail lead to the North Plant Site. The North Plant Site, like the Proposed Action would be fully developed, and an active management plan for the site and perimeter would limit the adverse effects and spreads of noxious and non-native, invasive weeds on and adjacent to the site. The rail lead exhibits the

potential for spread to new, un-infested areas from the NNRy; however, this alignment is short and that spread could be managed by BMPs. A score of 5 was attributed to the North and Middle Well Fields, as both pipeline alignments are of moderate length and present a potential for expansion of noxious and non-native, invasive weeds to new areas. A score of 6 was attributed to the Mt. Wheeler Transmission Line, Segments 1A and 1C, and Reduced Lages Station with Coyote Valley Ranch Well Field. Existing populations are present along the transmission line alignments, extensively in the Mt. Wheeler Transmission Line and more limited along Segments 1A and 1C. The potential for expansion along the existing portion of the Mt. Wheeler Transmission Line is considerable, although new introductions outside of this area would likely not cause increased effects beyond the existing condition. The potential for new introductions along Segments 1A and 1C is possible due to the adjacency to County Road 27; however, new infestations would likely not present significant adverse effects along the road right-of-way. A score of 7 was attributed to the Worker Village, Segment 1B, and the South Well Field. The spread of noxious and non-native, invasive weeds both to and from the Worker Village would be difficult to manage, due to the nature of the site usage; however, the Worker Village is a temporary feature and would be reclaimed at the end of construction, and new infestations could be controlled at that time. Existing populations are spread throughout Segment 1B, and the potential for additional spread is likely; however, any new populations would likely not cause adverse effects beyond the existing condition. The South Well Field, while not possessing significant existing populations, presents valley-length new corridor for expansion of noxious and non-native, invasive weed populations.

A score of 8 was attributed to the Alternative Rail Line. There are few populations of noxious and non-native, invasive weeds in Goshute Valley, where the northern half of the Alternative Rail Line is located, and the introduction of new infestations would be significantly adverse. Construction equipment, staging locations, and the linear nature of the Alternative Rail Line element pose difficult management considerations, so spread is probable. No elements were attributed Factor 2 scores of 9 or 10.

Risk Rating and Risk Degree Category

The risk rating is calculated by multiplying the Factor 1 and Factor 2 scores, and the degree categories range from None to High (**Table 4.7-4**). The North Plant Site, North and Middle Well Fields, and rail lead to the North Plant Site received Risk Ratings from 4 to 10 and a Risk Category of Low, therefore impacts from noxious and non-native, invasive weeds would be minimal. The Worker Village, Mt. Wheeler Transmission Line, Segments 1A and 1C, the Lages Station Well Field Water Supply, Reduced Lages Station with Coyote Valley Ranch Well Field, South Well Field, and Alternative Rail Line all received Risk Ratings between 12 and 36 and a Risk Category of Moderate, therefore impacts from noxious and non-native, invasive weeds would be moderate. Segment 1B received a Risk Rating of 56 and a Risk Category of High, therefore impacts from noxious and non-native, invasive weeds would be major. Risk Ratings and Risk Categories for all other elements were the same as for the Proposed Action.

4.7.3.6 Mitigation

Mitigation measures for the Alternative Action are the same as for the Proposed Action (see **Section 4.7.2.6**).

4.7.3.7 Unavoidable Adverse Impacts on Vegetation Resources

Unavoidable adverse impacts would be the same as the Proposed Action (**Section 4.7.2.7**).

4.7.3.8 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be similar in scale and degree as to the Proposed Action (**Section 4.7.2.8**).

4.7.3.9 Relationship of Short-term Uses and Long-term Productivity

Short-term uses and long-term productivity would be similar in scale and degree as to the Proposed Action (**Section 4.7.2.9**).

4.7.4 No Action Alternative

Under the No Action alternative, vegetative communities would continue to function in their current capacity. Noxious and non-native, invasive weeds would continue to be managed in their current capacity and would likely continue to spread nominally through continued normal activities and practices. Special status plants would not be affected.

4.8 Wildlife Resources, Including Special Status Wildlife, Migratory Birds, Fisheries, and Aquatic Species

4.8.1 Indicators and Methods

The construction and operation of the project may directly or indirectly impact wildlife through direct disturbance, habitat fragmentation, or air pollution (addressed in **Section 4.6**). This may impact game species and wildlife populations and indirectly affect hunting, fishing, and wildlife watching activities.

In response to these and other issues identified during scoping, the following indicators were considered when analyzing potential impacts to wildlife resources and special status species:

- Acres of different wildlife habitats (vegetation community types) physically disturbed and the juxtaposition of that disturbed habitat over the life of the project
- Acres of disturbance to, and the proximity of the proposed operations to, high value habitats such as: crucial and or high value big game ranges, wetlands, and seep and spring areas
- Acres of habitat types affected by groundwater drawdown (addressed in **Section 4.2**)
- Acres of game species habitat and watchable wildlife disturbed by the project

4.8.2 Proposed Action: South Plant Site

The following categories of wildlife inhabit and/or forage within the majority of the project area. Impacts to these species would be similar for all of the project features regardless of the alternative. Unless otherwise noted, they will not be discussed under each specific project feature.

Bats: No known bat roosting areas are present within any of the project features within Steptoe Valley. However, bat roosting areas could be present within some of the transmission line ROWs. Construction activities (especially blasting for transmission tower footings) in these areas could disturb bats. These impacts would be temporary and negligible. Bats likely use most of the project area for foraging opportunities. Construction activities could cause bats to temporarily abandon foraging within active

work zones. No long-term adverse effects to bats are expected to occur from the operations, maintenance or abandonment of any of the project's features or alternatives.

Migratory Birds: Several sensitive and numerous common avian species utilize the project area for foraging and nesting. Construction activities would affect avian species that currently forage or nest in these areas causing these species to displace to adjacent undisturbed areas. Mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would greatly reduce the likelihood of avian species nesting behavior being directly impacted or disrupted and/or nests being destroyed.

Small Mammals, Predatory Mammals, and Reptiles: Common small mammals (i.e., black-tailed jackrabbits and ground squirrels), common predators (i.e. kit fox, coyote, and badger), and common reptile species (i.e., sagebrush and fence lizards) that are known to occur throughout the project area would be displaced into adjacent undisturbed lands during construction activities. However, some small and less mobile wildlife species would be killed or injured during these construction activities.

Direct permanent impacts to wildlife habitat would occur due to construction of the power plant, substation, transmission line towers, water supply well field and pipeline, and rail lead. Additionally, temporary impacts would occur during the construction phase due to access road usage and construction corridors. **Tables 4.7-1** and **4.7-2** show the approximate acres of temporary and permanent impacts of the Proposed Action and the alternative components to the Proposed Action, by vegetative community. Where only temporary impacts are shown, the full acreage would be reclaimed upon abandonment of that project element. Where both temporary and permanent impacts are shown, the difference in acreage between temporary and permanent impacts would be reclaimed. Where only permanent impacts are shown, no reclamation would occur for that element. Permanent impacts would likely be long-term but minor, as the vegetative communities/wildlife habitat present within each of the project elements are common and widespread throughout the area. Wetland impacts would be avoided in all Proposed Action elements (wetlands are discussed in additional detail in **Section 4.2**).

4.8.2.1 Direct and Indirect Effects on Wildlife Resources from Plant Site Construction

The majority of this disturbance for the South Plant Site would be considered permanent as the life of the plant site is anticipated for 50 years. The associated worker village habitat disturbance would be short-term, lasting fewer than 10 years until successful reclamation has occurred. The Mt. Wheeler Transmission Line would consist of permanent habitat disturbance from the switching substation, the small footprints of each pole structure, and any access roads within the ROW.

Besides directly impacting suitable wildlife habitat, indirect impacts would result from the displacement of species utilizing these areas into adjacent undisturbed areas. Some, small and less mobile wildlife species would be killed or injured during construction activities.

<u>TEPC Species</u>

No TEPC species were observed or are known to routinely inhabit the South Plant Site, associated worker village, or the Mt. Wheeler Transmission Line corridor. Thus, no impacts to Federally Listed TEPC species are anticipated from the construction of these components of the project.

BLM Sensitive and State of Nevada Special Status Species

Only those species described in **Section 3.8** as having the potential to occur within the South Plant Site, the associated worker village, and the Mt. Wheeler Transmission line ROW to the South Plant Site are discussed below.

Sage Grouse: The South Plant Site, associated worker village, and portions of the Mt. Wheeler Transmission Line corridor are located within suitable sage grouse habitat. Construction of the South Plant Site would permanently impact 2,970 acres of suitable year-round sage grouse habitat. This represents less than one percent of the suitable year-round habitat within the Steptoe Valley Watershed, a minor impact. NDOW indicated that there was a historic lek (Glen Siding) located near the southwest corner of the South Plant Site. Surveys conducted in April of 2007 confirmed that this lek has not been reoccupied. The closest known active lek to the South Plant Site is the Dry Canyon 2 lek which is 3.7 miles away. Thus, no impacts to sage grouse leks and/or mating strategies are anticipated to occur due to the construction of the South Plant Site or the associated worker village.

The North Tehama Creek Lek is inactive and is located 2.0 miles away from the Mt. Wheeler Transmission Line corridor and the Whiteman Creek Lek is an active lek located 1.7 miles away from the Mt. Wheeler Transmission Line corridor. Both of these leks are located on the east side of US-93. Because US-93 likely acts as a habitat partition and neither lek is in close proximity to the construction areas, no adverse effects to sage grouse are expected to occur due to the construction of the Mt. Wheeler Transmission Line. Mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would further reduce the likelihood of sage grouse being adversely affected.

Pygmy Rabbit: Pygmy rabbits were observed south of the proposed access road to the associated worker village and both occupied and potential pygmy rabbit habitat exists within much of the Mt. Wheeler Transmission Line corridor. As discussed in **Section 4.8.2.3**, should the water supply alternative that utilizes the Coyote Valley Ranch Well Field be chosen, then well heads and a pumping station would remain as permanent impacts within the associated worker village property. It is highly unlikely that construction activities would directly impact pygmy rabbits. However, construction activities would impact suitable pygmy rabbit habitat within Wyoming sagebrush vegetation communities that occur within these components of the project. This area of disturbance represents a minor impact when compared to the numerous acres of suitable pygmy rabbit habitat that occurs adjacent to these proposed disturbances.

Raptors: Many types of raptors including hawks, owls, eagles, accipiters, and falcons currently utilize the South Plant Site, associated worker village, and the Mt. Wheeler Transmission Line for foraging activities. In addition, ferruginous hawk nesting habitat exists approximately 1.5 miles east of the worker village. Activities at the worker village are not expected to disturb the nesting behavior of ferruginous hawks in this area because they are likely habituated to vehicular traffic on US-93 and current mechanized agricultural practices on the private land.

Construction and human activities within the South Plant Site, associated worker village, and along the Mt. Wheeler Transmission Line would likely affect all raptor species that currently forage in the area, causing them to temporarily displace to adjacent undisturbed areas. This displacement would have negligible impacts to raptors. Mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would greatly reduce the likelihood of raptors being adversely affected. The Mt. Wheeler Transmission Line would increase the perching opportunities for raptors in the area.

Western Burrowing Owl: As stated in **Section 3.8.4.1**, burrowing owls are known to occur and nest within the South Plant Site. Disturbance associated with the construction of the power plant would discourage burrowing owls from nesting in the construction area. Burrowing owls that routinely inhabit the South Plant Site area would be displaced. This displacement would result in a long-term, minor impact. Considerable amounts of suitable burrowing owl nesting habitat would still be available in adjacent undisturbed areas. As with all raptor species, construction and human activities within the South Plant Site, associated worker village, and along the Mt. Wheeler Transmission Line would likely affect burrowing owls that currently forage in the area, causing them to temporarily displace to adjacent undisturbed areas. This displacement would be temporary and negligible. In order to avoid direct impacts to burrowing owls, mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would hope to prevent any burrowing owls or their nests from being directly impacted.

<u>*General Wildlife*</u>

Only those general wildlife species described in **Section 3.8,** as occurring or having the potential to occur based upon suitable habitats, within the South Plant Site, the associated worker village, and the Mt. Wheeler Transmission Line ROW to the South Plant Site are discussed below.

Pronghorn Antelope: The entire South Plant Site, associated worker village, and the Mt. Wheeler Transmission Line occur within year-round pronghorn antelope range. Noise and human disturbance associated with the construction activities of these three project features would temporarily displace pronghorn antelope into adjacent, undisturbed year-round range. The South Plant Site perimeter fence would exclude pronghorn from 2,970 acres of year-round range; this represents <0.5 percent of the total acres of year-round antelope range in the Steptoe Valley Watershed. This loss of habitat would be long-term and negligible to minor (based upon the remaining available acres of year-round antelope range in adjacent areas). Only a small portion of the Mt. Wheeler Transmission Lines would cause permanent loss of pronghorn year-round range and would be long-term and negligible. Therefore, the loss of year-round antelope range would be negligible to minor and long-term for the estimated life of the power plant and the Mt. Wheeler Transmission Line. The worker village would be located on private land that is currently fenced off from the adjacent BLM lands. Therefore, no additional loss of pronghorn year-round habitat is anticipated to occur and noise and human disturbance associated with construction-phase activities would be negligible and short-term.

Mule Deer: The Mt. Wheeler Transmission Line corridor east of US-93 is bordered by mule deer crucial winter range. Construction activities during winter months could displace some mule deer to higher elevations, thus increasing population density within this crucial winter range. Impacts to mule deer would be temporary (limited to one season) and minor.

<u>*Fisheries*</u>

No impacts to fisheries resources are anticipated from construction activities related to these project components, as they are not present within the project area and no drawdown impacts are anticipated as described in **Section 4.2**.

Operations, Maintenance, and Abandonment

Impacts to wildlife resources resulting from the operation, maintenance, and abandonment of the South Plant Site would potentially occur by increasing habitat impacts to existing vegetation communities at the outer margins of the plant site property during fence line maintenance. These impacts would be short-term and minor. Wildlife species using habitat outside the South

Plant Site would likely be affected by noise and increased human presence for the duration of the project. However, the disturbance response of wildlife using adjacent areas would likely decrease in frequency and intensity as species would become habituated to the everyday disturbances associated with routine plant operations and maintenance. There would be a potential for impacts to avian wildlife species colliding with the large, approximately 700-foot high stack.

Evaporation basins for process wastewater and contact stormwater would include environmental protection measures required by NDEP. A leak detection system, additional liner protection at the discharge point for the inlet piping, textured liner escape ramps, berms to ensure stability during operation, and environmental monitoring may be required. In addition, the Construction and Operations Maintenance Plan (COM Plan) would identify specific protection measures that would be implemented to minimize the potential for water quality related impacts to wildlife (see **Appendix 2A, Best Management Practices**). Treated sanitary effluent would be disposed of in an on-site drain field.

Impacts to wildlife resources at the associated worker village would be limited to short-term, negligible disturbances that may occur during routine road grading and maintenance. Vegetative communities on the worker village site would be reclaimed and returned to pre-existing condition upon abandonment, thus recreating any pre-existing wildlife habitat.

Operation and maintenance impacts along the Mt. Wheeler Transmission Line would be short-term and negligible to minor as a result of power line maintenance. These impacts would generally be the same as described for construction activities.

As described in **Section 4.6**, emissions from coal-fired power plants could include nitrogen and sulfur compounds. These potential air pollutants are transported in the atmosphere and deposited on the land surface through various means. Excess nitrogen deposition from power plant emissions in aquatic habitats has been shown to contribute to eutrophication, stressing aquatic life (EPA 2002). Excess nitrate compounds in waterways can promote the overgrowth of algaes, which depletes oxygen levels in the body of water leading to hypoxia (GCC 2007). Oxygen-depleted waters can lead to changes and loses in biodiversity and species distribution (EPA 2002). Excess sulfur and nitrate can lower the pH in a body of water and as this happens there is an increase in the aluminum content, which can stress aquatic life. Total pH conditions near 5, can interfere with maturation of fish eggs and pH levels below 5 can be toxic to some adult fish (EPA 2008).

4.8.2.2 Direct and Indirect Effects on Wildlife Resources from Electric Transmission Facilities

Construction

The proposed electric transmission facilities would pass over a wide range of plant communities as described in **Section 3.7**. The most common plant communities are dominated by Wyoming big sagebrush, creosote bush, pinyon-juniper, greasewood, and Douglas rabbitbrush. Together, these communities make up 77 percent of the ROW corridor for the electric transmission lines. Winterfat communities comprise less than one percent of the acres within the area of analysis.

Permanent disturbance to habitat would occur at each electric transmission tower structure located within the electric transmission facilities, as well as the Robinson Summit Substation and the Harry Allen Substation expansion. Disturbance for the Mt. Wheeler Transmission Line is included under South Plant Site, above.

Acreage impacts to the various vegetation communities/wildlife habitats within the project area for electric transmission facilities are described in **Section 4.7**. Soils and vegetation would be removed from or compacted in these areas, essentially eliminating forage production for the duration of disturbance, which, if work commenced any time after March 15, would generally be the remainder of the growing season. More sensitive wetland and riparian areas are present within various portions of the transmission line corridor ROWs as described in **Section 4.2** and **4.7**, but these habitats would be spanned by transmission lines and would not be impacted under the Proposed Action. Minor impacts to wetland habitats are anticipated under Alternative Segment 3, although BMPs would be implemented during construction to reduce and/or minimize potential impacts to wetland/aquatic habitats. Therefore, impacts to aquatic species or fisheries within the project area are anticipated to be negligible during construction of the transmission lines.

Most of the wildlife species that inhabit the transmission line ROWs are highly mobile and would likely vacate the construction area and alter movement patterns as construction personnel progress with construction activities. Species that are slow-moving or tend to retreat underground when approached could be directly affected by construction equipment and excavations for structure and substation equipment foundations. Excavations for foundations would be made with vehicle-mounted augers, backhoes, and other power equipment. In rocky areas, drilling and blasting may be necessary. The increased human activity and noise associated with construction activities would likely cause wildlife to temporarily avoid the area and displace into adjacent, undisturbed suitable habitat. Approximately 500 workers, over a 24-month period, spread out along various portions of the ROW, would be necessary to complete the construction of the electric transmission facilities. Increased traffic associated with construction activities has the potential to cause an increase in wildlife-vehicle collisions.

TEPC Species

Desert Tortoise: The desert tortoise is the only TEPC species that is known to occur within any of the electric transmission facilities. Tortoise and tortoise sign were recorded in Segments 9C, 9D, the southern portion of Segment 10 (alternative), Segment 11, and within the Harry Allen Substation expansion area. Approximately 71 acres of desert tortoise habitat would be permanently disturbed under the Proposed Action by the construction of electric transmission lines in Segment 9D (approximately 44 acres) and 11 (approximately 27 acres). Within Segment 10 (alternative), up to 8 acres of permanent disturbance would occur within desert tortoise habitat. An additional 10 acres of desert tortoise habitat would be permanently disturbed by the expansion of the Harry Allen Substation.

In order to avoid any direct effects to individual tortoises, all BMPs and federal endangered species protocols specific to desert tortoises would be employed prior to and during the construction of the transmission lines. A Biological Assessment (BA) is being prepared for this project that analyzes the potential impacts to TEPC species. Following the approval of the BA, a Biological Opinion would be issued by the USFWS for this project listing the Terms and Conditions that would need to be implemented and followed.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse: Sage grouse habitat occurs throughout Steptoe Valley, Butte Valley, and the White River Valley. There are numerous leks within or less than 2 miles of the electric transmission facilities project area. **Figure 3.8-2** illustrates the location of these leks and **Table 4.8-1** below shows the proximity of these leks to the nearest transmission line segment. Human disturbance associated with construction activities could disturb sage grouse during the

breeding season. In order to minimize or eliminate these disturbances, transmission line construction within 2 miles of active leks would likely take place outside the sage grouse breeding season (March 1 through May 15) if the lek was determined to be active and within close enough proximity to construction activities to potentially cause an impact to breeding behavior. **Section 4.8.2.5** identifies additional mitigation measures that would be taken in order to minimize construction phase disturbance to sage grouse. Outside of the breeding season and within suitable sage grouse habitat, sage grouse using the project area would be displaced into adjacent undisturbed habitat and suitable habitat would be impacted.

TABLE 4.8-1. SAGE GROUSE LEKS AND PROXIMITY TO TRANSMISSION LINE SEGMENTS

LEK NAME	ACTIVE / NOT ACTIVE/ HISTORIC	APPROXIMATE DISTANCE FROM THE NEAREST TRANSMISSION LINE ROW
Mud Spring N	Active	0.2 miles from Segment 4A (Line #1)
Water Canyon Bench	Unknown	0.9 miles from Segment 4A (Line #1)
Dry Canyon 3	Unknown	0.8 miles from Segment 4A (Line #2)
Dry Canyon	Unknown	0.6 miles from Segment 4A (Line #1)
Dry Canyon 2	Active	1.3 miles from Segment 4A (Line #2)
Dry Canyon Road	Unknown	[illegible].8 miles from Segment 4A (Line #2)
Glenn Siding	Historic	0.6 miles from Segment 4A (Line #1)
Heusser Mountain E	Historic	0.2 miles from Alternative Segment 3 (Line #1)
McGill Junction	Unknown	Within Alternative Segment 3 (Line #2)
Butte Valley SE	Unknown	1.2 miles from Segment 1D (Line #2)
South Butte Valley 2	Inactive	0.1 miles from Segment 1D (Line #2)
South Butte Valley 3	Inactive	0.4 miles from Segment 1D (Line #1)
Blackjack W	Unknown	1.8 miles from Segment 6C (Line #2)
Gardner Ranch N	Unknown	1.8 miles from Segment 6C (Line #2)
Ellison Creek N	Active	0.5 miles from Segment 6C (Line #1)
Ellison Creek N N	Inactive	Within Segment 6C (Line #2)
Runway	Unknown	0.3 miles from Segment 6C (Line #2)
Ellison Creek	Inactive	1.0 miles from Segment 6C (Line #2)
Ellison Knobs	Unknown	1.7 miles from Segment 6C (Line #2)
White River	Active	0.2 miles from Segment 6C (Line #2)

Pygmy Rabbit: Pygmy rabbits or their sign were recorded in Segments 3 (alternative), 4A, 1D, and 6C. Pygmy rabbits are highly mobile and would likely vacate the construction area and alter movement patterns as construction personnel progress with construction activities. As with other ground-dwelling species, pygmy rabbits could be directly affected by construction activities. The construction of electric transmission lines would have a negligible, short-term impacts on pygmy rabbits within the construction area and minor, long-term impacts on potentially suitable habitat.

Raptors: Many species of raptors utilize the diversity of habitats that exist throughout all of the proposed electric transmission line segments. Noise and human disturbance associated with the construction of the transmission lines would have a temporary impact on foraging raptors and would temporarily displace them to areas outside the active construction zone. Mitigation measures (**Section 4.8.2.5**), such as timing restrictions and active nest buffers, would be employed prior to and during construction activities that would greatly reduce the likelihood of raptor nesting behavior being disrupted or nests being destroyed. The intensity of these impacts would vary according to species, but impacts that are a direct result of construction activities are

not expected to exceed a negligible level. The installation of transmission line structures would increase the perching opportunities for raptors throughout the project area.

Western Burrowing Owl: As stated in **Section 3.8.4.2**, burrowing owl nests have been observed at two separate locations within Segment 4A and within Segment 10 (alternative). The construction of Segment 4A would have temporary, negligible impacts to burrowing owls by discouraging them from foraging or nesting within the active construction zone and by displacing them to adjacent areas with suitable foraging and nesting habitat. In order to avoid direct impacts to burrowing owls, mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would greatly reduce the likelihood of burrowing owl nests being destroyed.

Banded Gila Monster: Potential banded Gila monster habitat exists within the vicinity of the southernmost portions of the electric transmission lines in Lincoln and Clark County. Its geographic range approximates that of the desert tortoise. Please refer to **Section 4.8.2.5** for specific mitigation measures regarding the banded Gila monster.

Terrestrial Invertebrates: The dark sandhill skipper, the Steptoe Valley crescentspot, and the White River wood nymph have the potential of occurring near Segment 4A and Segment 3 (alternative). Specifically, the dark sandhill skipper has been recorded near Steptoe Slough and Warm Springs (along Duck Creek), the Steptoe Valley crescentspot has been recorded near Bassett Lake, Steptoe Slough, and Warm Springs (along Duck Creek) and the White River wood nymph has been recorded near Warm Springs (**Figures 3.8-3a and 3.8-3b**). Human disturbance could cause these invertebrates to temporarily avoid the immediate work areas while transmission line segments are being constructed. Impacts to jurisdictional wetlands/riparian areas would be permitted under Section 404 of the Clean Water Act (**Section 4.2**). These areas would be spanned wherever possible. Any roads and transmission tower footprints would be minimized to the extent possible that allows for safe construction practices. And standard erosion-control BMPs would be utilized. Construction in these riparian habitats would be closely monitored in order to ensure all feasible measures are taken to reduce habitat degradation. Construction of transmission line segments that span these habitats would be short in duration and is not expected to exceed a negligible level of disturbance to these terrestrial invertebrate species.

Aquatic Invertebrates: Several sensitive aquatic species have been located within Steptoe Valley (**Figure 3.8-3a**). The majorities of these species are located in isolated springs situated on the eastern foothills of the Egan Range and are not in close proximity to any of the proposed transmission lines. Therefore, no impacts to aquatic invertebrates are expected to occur due to the construction of the electric transmission facilities.

General Wildlife

Pronghorn Antelope: With the exception of some higher elevation areas, pronghorn year-round range exists within all electric transmission line segments that are north of Segments 9C and 9A (alternative). No pronghorn crucial winter range exists within the project area. Noise and increased human activity would likely cause pronghorn to be displaced to neighboring areas with suitable habitat during construction of the transmission lines. Impacts to pronghorn resulting from construction activities would be temporary and negligible to minor.

Mule Deer: Several transmission line segments pass through small portions of mule deer crucial winter range (**Figure 3.8-4b**). **Table 4.8-2** below indicates which transmission line segments are within and/or adjacent to mule deer crucial winter range. Noise and increased human activity in

these areas and other suitable mule deer range would likely cause mule deer to be displaced to neighboring areas with suitable habitat during construction of the transmission lines. Construction activities during winter months that occur adjacent to crucial winter range could displace some mule deer to higher elevations, thus increasing population density within this winter range. Construction activities within crucial winter range would be prohibited between November and March. Therefore, impacts to mule deer resulting from construction activities would be temporary and minor.

TABLE 4.8-2. MULE DEER CRUCIAL WINTER RANGE PROXIMITY TO TRANSMISSION LINE SEGMENTS

TRANSMISSION LINE SEGMENT	PROXIMITY TO TRANSMISSION LINE SEGMENT
Segment 1D	Portions within crucial winter range located on the eastern foothills of the Egan Range
Segment 4A	Portions within crucial winter range where Segment 4A and 1D merge on the eastern foothills of the Egan Range
Segment 3 (Alt)	Adjacent to crucial winter range in the Bassett Lake Area
Segment 6C	Adjacent to crucial winter range where Segment 6C intersects Highway 6
Segment 6C	Portions within crucial winter range near Wells Station in the Grant range
Segment 6C	Adjacent to crucial winter range near the northern toe of the Golden Gate Range
Segment 6C	Portions within crucial winter range of Silver King Pass on the Schell Creek Range
Segment 8	Portions within crucial range surrounding the Bristol Wells area.
Segment 8	Adjacent to crucial range along the western slope of the Highland range

Elk: There is no elk crucial winter range or crucial summer range within the project area. Segments of the transmission line alternatives that are situated in mid to upper elevations pass through elk year-round habitat. **Table 3.8-6** and **Figure 3.8-4c** detail these areas. Elk sign was numerous in the vicinity of the Robinson Summit Substation and the Silver King Pass portion of Segment 6C. Noise and increased human activity would likely cause elk to be displaced to neighboring areas with suitable habitat during construction of the transmission lines and/or the Robinson Summit Substation. Impacts to elk resulting from construction activities would be temporary and would not be expected to exceed a negligible level.

Bighorn Sheep: No occupied Rocky Mountain bighorn sheep range is located near any of the transmission line ROWs and only a small portion of Segment 1D (in the Butte Mountains) is situated near potential Rocky Mountain bighorn sheep range. Several transmission line segments pass through occupied and potential desert bighorn sheep range (**Figure 3.8-4d**). **Table 4.8-3** below indicates which transmission line segments are within and/or adjacent to occupied desert bighorn sheep range.

No surface activity would take place within occupied desert bighorn sheep habitat from March 1 through May 31 and from July 1 through August 31. Noise and increased human activity would likely cause bighorn sheep to be displaced to neighboring areas with suitable habitat during the construction of transmission lines. Impacts to bighorn sheep resulting from construction activities would be temporary and minor.

TABLE 4.8-3. OCCUPIED DESERT BIGHORN RANGE PROXIMITY TO TRANSMISSION LINE SEGMENTS

TRANSMISSION LINE SEGMENT	PROXIMITY TO TRANSMISSION LINE SEGMENT
Segment 6C	Portions within occupied range surrounding Silver King Pass of the Schell Creek Range
Segment 9A	Within occupied range
Segment 9C	Within occupied range
Segment 10 (Alt)	Portions within occupied range of the Delamar Mountains
Segment 10 (Alt)	Adjacent to occupied range along the western foothills of the Meadow Valley Mountains
Segment 11	Portions within occupied range of the Arrow Canyon Range

Waterfowl: Three key waterfowl areas have been identified within the project area. Segment 3 (alternative) is located adjacent to Bassett Lake and the Steptoe Slough area, Segment 6C passes just south of the southern portion of the Kirch Wildlife Management Area, and the northern portion of Segment 9D passes less than a thousand feet from the Pahranagat National Wildlife Refuge. Noise and increased human activity associated with the construction of the transmission lines could have temporary impacts on nesting and foraging activities of waterfowl. The intensity of these impacts would vary according to species, but impacts that are a direct result of construction activities would be temporary and are not expected to exceed a minor level.

Operations, Maintenance, and Abandonment

Wildlife could be periodically disturbed by annual maintenance/inspections and any unplanned repairs that may be required to correct any failures. The electric substations would be visited regularly to perform routine maintenance. Vegetation would be trimmed as-needed under and along the transmission line ROWs to minimize potential interference with the transmission lines. Planned operations and maintenance on transmission lines would consist of annual line patrol by two linemen by helicopter. Additional unscheduled patrols may be required by ATV, truck, or bucket truck, if issues are encountered. Because of the intermittent nature of maintenance operations, the presence of linemen and their equipment are not anticipated to result in any long-term effects on wildlife.

<u>*TEPC Species*</u>

Desert Tortoise: In recent years, common ravens have become suspect of preying heavily upon juvenile desert tortoises. Other potential avian predators on juvenile desert tortoises in California include: golden eagles, greater roadrunner (*Geococcyx californianus*), redtailed hawk, burrowing owl, and loggerhead shrike (*Lanius ludovicianus*). There is little reason to suspect that other predators are responsible for killing the large number of tortoises found (Boarman 2002). So, whereas other avian species may occasionally prey on tortoises, no bird species other than ravens are known to eat juvenile tortoises (<100 mm MCL) in any great quantities (Boarman 2002).

The electric transmission line towers that would be located in or near desert tortoise habitat would incorporate the best feasible design features that would deter ravens and raptors from nesting or roosting upon them. Boarman (2002) suggests that telephone and transmission towers of solid construction rather than lattice and with diagonal crossbars instead of horizontal ones would be harder for ravens to nest on.

Although unlikely, desert tortoises could be affected by personnel and equipment necessary for routine and unscheduled maintenance. In order to reduce the chance of direct impacts to tortoises, all applicable mitigation measures and Terms and Conditions in pertinent BOs would be applied prior to and during operations, maintenance, or abandonment procedures.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse: Power lines can provide hunting perches for raptors in treeless areas. Sage grouse may also be injured or killed by flying into these structures. Power lines most likely impact grouse near leks, in brood-rearing habitat, and in wintering areas that also support large numbers of wintering raptors. Construction of new power lines contributes to habitat degradation when accompanied by new roads or other infrastructure, e.g., pipelines, fences, etc. (Kobriger and McCarthy 2005).

Utilities commonly make power poles safe for raptors to use as perches, but this poses a dilemma in sage-grouse habitat. It is important that parties involved with power lines utilize appropriate guidelines (Avian Power Line Action Committee Guidelines) when designing raptor perch sites and perch guards (Kobriger and McCarthy 2005).

Power lines not only increase habitat fragmentation, but also provide perches for avian predators of sage grouse (Braun 1998). Although the magnitude of such effects on sage-grouse habitats and populations is unknown, sage-grouse use has been shown to increase as distance from power lines increases (Braun 1998). Disturbance from raptors, particularly golden eagles (*Aquila chrysaetos*), may disrupt strutting males on leks (Rogers 1964, Ellis 1984); thus, structures that provide perches for raptors may increase such disturbance. Studies in California identified three factors associated with power lines that could decrease grouse numbers or lek use, either singly or in combination: 1) raptors, especially immature golden eagles, hunt more efficiently from perches such as towers and may harass or take adult grouse near or on leks; 2) common ravens (*Corvus corax*) may use the towers as perches and nest sites, and prey on eggs and young of sage grouse near leks; and 3) sage grouse may respond to towers as potential raptor perch sites and thus abandon, or decrease their use of, a lek from which towers can be seen (Rowland 2004).

Section 4.8.2.5 identifies specific mitigation measures that would be applicable to transmission lines in both occupied and suitable sage grouse habitat. These measures include transmission tower design features that are intended to reduce collisions and help negate sage grouse predation by discouraging raptors from utilizing power lines as hunting facilities.

Sage grouse leks in close proximity to transmission lines could be abandoned. The operations, maintenance, and abandonment of electric transmission lines would have both short-term and long-term impacts on sage-grouse. The magnitude of these impacts could range from negligible to minor.

Pygmy Rabbit: The construction of the power lines and the Robinson Summit Substation within or near suitable habitat, would result in direct sagebrush habitat loss and would provide raptor perches that facilitate predation, disrupts pygmy rabbit dispersal corridors, and increases human access for recreational activities, all of which impact pygmy rabbits and their habitat. Power line structures can provide hunting and roosting perches, and nesting support, for many raptor species that can prey upon pygmy rabbits. These power lines and fences are often accompanied by maintenance roads that may serve as travel corridors for predators, spread weeds, and offer access for hunters and recreationists (Haworth 2005).

The operations, maintenance, and abandonment of electric transmission lines would have both transient and long-term impacts on pygmy rabbits. The magnitude of these impacts could range from negligible to minor.

Raptors, includes bald eagle: Numerous studies have been conducted and published on the interactions between raptors and electric transmission lines. Raptor electrocution continues to be one of the major wildlife concerns of state and federal agencies. Collisions with and electrocutions by power lines are common and have been well documented for at least four decades.

Electric transmission lines and towers have been known to have a beneficial effect on raptors as well. Despite design features that are intended to discourage roosting, perching and nesting, transmission lines have been known to provide areas that facilitate hunting. While these effects are beneficial for raptors, they are adverse to prey species (including sensitive species like sage grouse and pygmy rabbits).

The Avian Power Line Interaction Committee (APLIC) published a book entitled *Suggested Practices for Avian Protection on Power Lines: The State of the Art 2006*. This document would be employed as a BMP with regard to the design, construction, operations and maintenance of the EEC and its facilities. The implementation of these guidelines should significantly reduce the number of raptors that could potentially collide with or fly into transmission lines. Therefore, impacts to raptors are expected to be negligible to moderate and long-term.

Western Burrowing Owl: As with all avian wildlife, the introduction of new transmission lines increases the likelihood of burrowing owls experiencing in-flight collisions with towers and lines. However, due to their keen eyesight and small stature, impacts to burrowing owls would likely be less severe than those anticipated for larger birds of prey. The presence of transmission lines may deter burrowing owls from nesting in previously occupied habitat. The operations, maintenance, and abandonment of electric transmission lines would have both short-term and long-term impacts on burrowing owls. The magnitude of these impacts could range from negligible to moderate.

<u>General Wildlife</u>

Pronghorn Antelope: Due to the vast availability of suitable pronghorn habitat, and the ability of this species to habituate to human-made structures, no long-term impacts to pronghorn are expected to occur due to operations, maintenance, and abandonment of any of the electric transmission facilities.

Mule Deer: Due to the ability of mule deer to habituate to human-made structures, no long-term impacts to this species are expected to occur due to operations, maintenance, and abandonment of any of the electric transmission facilities.

Elk: Elk may experience short-term impacts following the construction of the Robinson Summit Substation. Elk would likely alter their current movement and foraging patterns in order to avoid this newly constructed feature. However, due to the ability of elk to habituate to human-made structures, no long-term impacts to this species are expected to occur due to operations, maintenance, and abandonment of the electric transmission facilities.

Bighorn Sheep: No long-term impacts to this species are expected to occur due to operations, maintenance, and abandonment of any of the electric transmission facilities.

Avian Wildlife: The Avian Power Line Interaction Committee (APLIC) published a book entitled *Suggested Practices for Avian Protection on Power Lines: The State of the Art 2006*. This

document would be utilized as a BMP for minimizing adverse impacts to avian wildlife. Engineers have also incorporated design features for transmission line towers that are intended to reduce collisions, electrocutions, roosting, perching, and nesting.

Waterfowl: As noted in **Section 3.8.3.3,** several species of waterfowl inhabit various portions of the electric transmission facilities. As with all avian wildlife, the introduction of new transmission lines increases the likelihood of waterfowl experiencing in-flight collisions with towers and lines. As mentioned above, design features intended to reduce collisions by making transmission lines more visible to waterfowl would be applied in all areas that waterfowl commonly migrate through.

4.8.2.3 Direct and Indirect Effects on Wildlife Resources from Water Supply Facilities

The Proposed Action includes a well field on private land near Lages Station, and a water supply pipeline extending from the well field south to the South Plant Site.

There are five water supply alternatives to the Proposed Action, including the following:

- Reduced Lages Station with Coyote Valley Ranch Well Field
- Reduced Lages Station with Limited South Well Field
- Middle Well Field
- South Well Field
- Duck Creek Impoundment

Construction

Direct effects to wildlife habitat from the Proposed Action would be identical to those described in **Section 4.7.2.3** since all of the vegetative communities also serve as some form of wildlife habitat. The Proposed Action would include permanent impacts to Wyoming sagebrush, greasewood, and agricultural/pasture communities on private land for construction of the well heads and pumping station. This impact is expected to be long-term and minor.

Temporary disturbance of Wyoming sagebrush, black sagebrush, greasewood, rubber rabbitbrush, and alkaline meadow (among others) during construction of the pipeline from Lages Station to the South Plant Site is also expected, as shown in **Table 4.7-1**. A 60-foot long-term ROW would be established; with the surface area associated with the temporary construction ROW being reclaimed upon completion of construction.

As an alternative to the Lages Station Well Field water supply, the reduced Lages Station with Coyote Valley Ranch Well Field water supply would involve the same area and impacts as the Proposed Action, with the addition of a well field located within the associated worker village area and a pipeline corridor crossing Wyoming sagebrush and greasewood communities (**Table 4.7-2** and **Figure 3.7-1**). These additional impacts would be long-term and minor.

The Reduced Lages Station with Limited South Well Field would have the same impacts to wildlife habitats as the Proposed Action, since the wells associated with the Limited South Well Field are all located within the pipeline corridor.

Another water supply alternative, the Middle Well Field, would primarily impact Wyoming sagebrush, Douglas rabbitbrush, and rubber rabbitbrush, as well as greasewood and alkali meadow in smaller amounts (**Table 4.7-2**). These impacts are expected to be long-term and minor, as the habitat communities are common throughout Steptoe Valley.

The South Well Field alternative would impact small amounts of Douglas rabbitbrush and Wyoming sagebrush habitats (**Table 4.7-2**). These impacts are expected to be long-term and minor.

The Duck Creek Impoundment alternative involves the delivery of water through a pipeline from impoundments located in Duck Creek Valley. Although construction of the pipeline is likely to occur within the existing road grade, the ROW has the potential to affect Wyoming sagebrush and Douglas rabbitbrush habitat communities, as well as other habitats in smaller amounts (**Table 4.7-2**). These effects are likely to be negligible to minor, since the road grade has already been disturbed.

Because most of the features associated with water supply facilities would be buried once constructed, most of the adverse effects to wildlife associated with this feature are likely to be limited to noise and human disturbance created during the construction of the water supply facilities.

<u>*TEPC Species*</u>

No TEPC species were observed or are known to routinely inhabit the water supply facilities project areas. Thus, no impacts to Federally Listed species are anticipated from the construction of these project features.

<u>*BLM Sensitive and State of Nevada Special Status Species*</u>

Sage Grouse: Sage grouse habitat exists throughout much of the water supply facilities area (**Figure 3.8-2**). **Table 4.8-4** below indicates which water supply feature(s) are within 2 miles of sage grouse lek areas. Mitigation measures detailed in **Section 4.8.2.5** would be implemented prior to and during construction activities. These measures should help minimize some of the potential impacts that would be expected to occur should these water supply alternatives be developed.

Because the Becky Spring lek is 2 miles away from the Lages Station Well Field and US-93 likely serves as a habitat partition, no adverse effects to this lek are expected to occur due to the construction of this feature.

TABLE 4.8-4. SAGE GROUSE LEKS AND PROXIMITY TO WATER SUPPLY FACILITIES

LEK NAME	ACTIVE/ NOT ACTIVE/ HISTORIC	PROXIMITY TO WATER SUPPLY FEATURE(S)
Becky Spring	Active	2.0 miles from the Lages Station Well Field
N Tehama Creek	Inactive	2.0 miles from the Lages Station Water Line / Middle Well Field
Whiteman Creek	Active	1.7 miles from the Lages Station Water Line / Middle Well Field
Dry Canyon	Unknown	1.8 miles from the South Well Field
Paine Springs	Historic	0.8 miles from the Duck Creek Water Impoundment
Glenn Siding	Historic	1.5 miles from the South and Limited South Well Fields

The N Tehama Creek and Whiteman Creek leks are also located a significant distance from the Lages Station Water Line and the Middle Well Field and are likely partitioned off by US-93. The N Tehama Creek lek is inactive; however construction activities are not likely to prevent sage grouse from reoccupying this area. Therefore, no significant impacts to these sage grouse leks are expected to occur due to the construction of these project features.

It is unknown whether the Dry Canyon Lek is active. However, development of the South Well Field could prevent sage grouse from utilizing this lek for one season, although the lek is 1.8 miles away from any potential surface disturbance. Since there are adequate sage grouse lek areas nearby, these impacts would be expected to be temporary and minor.

The historic Paine Springs Lek would likely remain unoccupied during the development of the Duck Creek Water Impoundment. These impacts would be temporary and negligible.

The historic Glenn Siding Lek would likely remain unoccupied during the development of the Limited South Well Field. These impacts would be temporary and negligible, but would be long-term and minor if the EEC was constructed on the South Plant Site.

Pygmy Rabbit: Pygmy rabbit sign was recorded along a large majority of the water supply line between the Lages Station Well Field and the South Plant Site (including the Middle, South, and Limited South Well Field Alternatives). The Coyote Valley Ranch Well Field Alternative is also situated within suitable pygmy rabbit habitat (**Figure 3.8-3a**). Pygmy rabbits are highly mobile and would likely vacate the construction area and alter movement patterns as construction personnel progress with construction activities. As with other ground-dwelling species, pygmy rabbits could be directly affected by construction activities. Destruction of some pygmy rabbit burrows would be unavoidable and direct mortality of some members of this species could occur, although the overall impact is expected to be minor based upon adjacent undisturbed habitat.

Raptors: No known raptor nesting areas are located within close proximity to any of the Proposed Action water supply facilities. Raptors that utilize areas associated with the water supply facilities may temporarily abandon foraging activities in the construction areas. Impacts to raptors resulting from construction activities associated with the water supply facilities would be temporary and are not expected to exceed a negligible level.

Western Burrowing Owl: Burrowing owl nests have been observed at two separate locations near the south end of the Lages Station Water Supply Line and South Well Field. In order to avoid direct impacts to burrowing owls, mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would greatly reduce the likelihood of burrowing owl nests being destroyed. Activities necessary for well development and/or the construction of the pipeline would have temporary minor impacts to burrowing owls by discouraging them from inhabiting the work area and by displacing them to adjacent areas with suitable nesting habitat.

Aquatic Invertebrates: Several sensitive aquatic species have been located within Steptoe Valley (**Figure 3.8-3a**). The majorities of these species are located in isolated springs situated on the eastern foothills of the Egan Range and are not in close proximity to any of the water supply facilities. Therefore, no impacts to aquatic invertebrates are expected to occur due to the construction of the water supply facilities.

General Wildlife

Pronghorn Antelope: All of the water supply facilities are situated within pronghorn antelope year-round range. Construction of these facilities would likely cause pronghorn to temporarily avoid the work areas. Because there is ample suitable pronghorn habitat within Steptoe Valley, construction of the water supply facilities would have a temporary negligible effect on this species.

Mule Deer: Much of the Alternative Duck Creek Water Pipeline corridor occurs within mule deer crucial winter range. No surface activity would take place in mule deer fawning grounds (if present) from April 15 through June 30. And no surface activity would take place within crucial winter range from November 1 through March 31 (if present).

Human activity in the Duck Creek Valley is common and the area has anthropogenic features including houses, fences, improved roads, and an existing pipeline. It is likely that mule deer are highly habituated to human activity and structures in this area. Still, noise and human disturbance during construction activities could displace some mule deer to other areas. Impacts to mule deer resulting from construction activities associated with the water supply facilities would be temporary and are not expected to exceed a negligible level.

Waterfowl: Portions of the alternative Duck Creek Impoundment and water supply line include, or are adjacent to, riparian areas that support a variety of waterfowl species. Human activity in the Duck Creek Valley is common and the area has anthropogenic features including houses, fences, improved roads, and an existing pipeline. It is likely that waterfowl, although potentially highly habituated to human activity and structures in this area, would still be displaced during construction activities. Further, noise and human disturbance during construction activities could discourage waterfowl from occupying the area. Impacts to waterfowl resulting from construction activities associated with the water supply facilities would be short-term and minor.

Operations, Maintenance, and Abandonment

<u>*TEPC Species*</u>

No TEPC species were observed or are known to routinely inhabit the water supply facilities area. Thus, no impacts to Federally Listed species are anticipated from the operations, maintenance, and abandonment of the water supply facilities.

<u>*BLM Sensitive and State of Nevada Special Status Species*</u>

Sage Grouse, Pygmy Rabbit, and Western Burrowing Owl: Displacement to these species due to operations, maintenance, and abandonment of the water supply facilities could occur during the life of the project.

Aquatic Invertebrates: Several sensitive aquatic species have been located within Steptoe Valley (**Figure 3.8-3a**). The majorities of these species are located in isolated springs situated on the eastern foothills of the Egan Range and are not in close proximity to any of the water supply facilities. In addition, as described in **Section 4.2**, drawdown impacts to springs that contain sensitive aquatic invertebrates are expected to be negligible. Therefore, negligible impacts to aquatic invertebrates could occur due to the operation of the water supply facilities.

<u>*General Wildlife*</u>

Big Game: Pronghorn antelope and mule deer may experience disruption of normal behavior patterns due to operations, maintenance, and abandonment of the water supply facilities over the life of the project. No other major effects are expected to impact these species due to operations, maintenance, and abandonment of the water supply facilities.

Avian Wildlife: No significant effects are expected to impact avian wildlife due to operations, maintenance, and abandonment of the water supply facilities.

4.8.2.4 Direct and Indirect Effects on Wildlife Resources from Rail Facilities

Construction

<u>*TEPC Species*</u>

No TEPC species were observed or are known to routinely inhabit the rail facilities project area. Thus, no impacts to Federally Listed species are anticipated from the construction of these project features.

<u>*BLM Sensitive and State of Nevada Special Status Species*</u>

Sage Grouse: Various forms of sage grouse habitat (nesting, summer, or winter range or a combination) occur within the majority of the project area for the Alternative Rail Line and the rail lead (**Figure 3.8-2**). **Table 4.8-5** below indicates which rail feature(s) are within 2 miles of sage grouse leks. Mitigation measures detailed in **Section 4.8.2.5** would be implemented prior to and during construction activities. These measures should help minimize/reduce potential impacts that would be expected to occur should the Alternative Rail Line or the rail lead be constructed.

TABLE 4.8-5. SAGE GROUSE LEKS AND PROXIMITY TO PROPOSED ACTION RAIL FACILITIES

LEK NAME	ACTIVE/ NOT ACTIVE/ HISTORIC	PROXIMITY TO RAIL FACILITIES
N Tehama Creek	Inactive	2.0 miles from the Alternative Rail Line
Whiteman Creek	Active	1.7 miles from the Alternative Rail Line
Dry Canyon	Unknown	1.8 miles from the Alternative Rail Line
Glenn Siding	Historic	Within the South Plant Site Rail Lead

The N Tehama Creek and Whiteman Creek leks are located a significant distance from the Alternative Rail Line and are likely partitioned off by US-93. The N Tehama Creek lek is inactive; however construction activities are not likely to prevent sage grouse from reoccupying this area. Breeding/mating activity on the Whiteman Creek lek would likely not be disrupted due to construction activities. Therefore, no significant impacts to these sage grouse leks are expected to occur due to the construction of these project features.

It is unknown whether the Dry Canyon Lek is active. However, development of the Alternative Rail Line could prevent sage grouse from utilizing this lek for one season, although the lek is 1.8 miles away from any potential surface disturbance. Since there are adequate sage grouse lek areas nearby, these impacts would be expected to be temporary and minor.

The rail lead is located within suitable year-round sage grouse habitat. NDOW indicated that there was an historic lek (Glen Siding lek) located where the rail lead would enter the southwest corner of the South Plant site; however, this lek has been inactive for several years. JBR surveyed the area in April 2007 and did not find any indication that the lek was active or had been active recently. Therefore, no significant impacts to sage grouse are expected to occur due to the construction activities associated with this rail lead.

Western Burrowing Owl: Two known owl burrows and suitable habitat for burrowing owls is located near the rail lead. In order to avoid direct impacts to burrowing owls, mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would greatly reduce the likelihood of burrowing owl nests being destroyed. Construction of the rail lead would have temporary, minor impacts to burrowing owls by discouraging them from

inhabiting the work area and by displacing them to adjacent areas with suitable nesting and foraging habitat.

Pygmy Rabbit: Pygmy rabbit habitat exists throughout portions of the Alternative Rail Line corridor. Pygmy rabbits are highly mobile and would likely vacate the construction area and alter movement patterns as construction personnel progress with construction activities. As with other ground-dwelling species, pygmy rabbits could be directly affected by construction activities. Destruction of some pygmy rabbit burrows would be unavoidable and direct mortality of some members of this species could occur, although the overall impact is expected to be minor based upon adjacent undisturbed habitat.

<u>*General Wildlife*</u>

Pronghorn Antelope: The Alternative Rail Line and the rail lead are located within pronghorn year-round range. Construction of rail facilities would likely cause pronghorn to temporarily avoid those areas. These impacts would be temporary and are not expected to exceed a minor level.

Mule Deer: Mule deer have been observed within the proposed Alternative Rail Line corridor between Lages Station and the South Plant Site. Construction of rail facilities would likely cause mule deer to temporarily avoid the construction areas in Steptoe Valley. These impacts would be temporary and are not expected to exceed a negligible level.

Operations, Maintenance, and Abandonment

<u>*TEPC Species*</u>

No TEPC species were observed or are known to routinely inhabit the rail facilities area. Thus no impacts to Federally Listed species are anticipated from the operations, maintenance and abandonment of these project features.

<u>*BLM Sensitive and State of Nevada Special Status Species*</u>

Sage grouse: Sage grouse habitat exists throughout much of the rail facilities area. The N Tehama Creek and Whiteman Creek leks are within 2 miles of the Alternative Rail Line. However, both are situated east of US-93 and only one has been identified as an active lek. Because US-93 likely acts as a form of habitat partition, and neither lek is in close proximity (less than 1 mile) to these features, no significant impacts to sage grouse are expected to occur due to operations, maintenance, and abandonment of the rail facilities.

It is unknown whether the Dry Canyon Lek is active. Disturbance caused by the operation of trains could deter sage grouse from occupying this inactive lek site. No other significant impacts are anticipated from the operations, maintenance and abandonment of the Rail facilities.

The rail lead is located within suitable year-round sage grouse habitat. NDOW indicated that there was an historic lek (Glen Siding lek) located where the South Plant Site Rail Lead would enter the southwest corner of the South Plant site; however, this lek has been inactive for several years. JBR surveyed the area in April 2007 and did not find any indication that the lek was active or had been active recently. Disturbance caused by the operation of trains could deter sage grouse from reoccupying this inactive lek site. No other significant impacts are anticipated from the operations, maintenance and abandonment of the rail facilities.

Western Burrowing Owl: Two known owl burrows and suitable habitat for burrowing owls is located near the rail lead. Burrowing owls have demonstrated the capacity to habituate themselves to humans as well as anthropogenic structures and machinery. Therefore, trains

and rail operations, maintenance and abandonment are not expected to inflict any major impacts on burrowing owls nesting or using the immediate area.

Pygmy Rabbit: Pygmy rabbits that use the rail facilities project area and/or the existing NNRy corridor could be killed by rail traffic. The number of potential pygmy rabbit fatalities caused by collisions with trains is presently unquantifiable. However, mortality rates are not expected to exceed a negligible level and would not pose an additional threat to any local populations. Pygmy rabbits that currently use the project area would likely migrate to adjacent undisturbed areas as a result of the rail traffic.

<u>*General Wildlife*</u>

Pronghorn Antelope: The Alternative Rail Line and rail lead are located within pronghorn year-round range. There are documented cases of trains colliding with antelope and antelope herds. However, in most of these incidences, the animals were trapped within the rail corridor by fences. No long expanses of fencing are planned to be installed adjacent to the Alternative Rail Line or rail lead. Still, some members of this species could be killed through collisions with rail traffic. Pronghorn have demonstrated the capacity to habituate themselves to rail traffic. Mortality rates attributed to train collisions would likely decrease over time as pronghorn become familiar with rail traffic. It is anticipated that the Steptoe Valley herds would eventually resume utilizing most of the range abandoned because of construction activities and rail traffic. Mortality rates are not expected to exceed a negligible level.

Mule Deer: No long-term impacts to mule deer are expected to occur due to the operations, maintenance or abandonment of the Alternative Rail Line.

4.8.2.5 Mitigation

<u>1. Banded Gila Monster Mitigation Measures</u>

Banded Gila monsters can occur within the southern portion of the Project Area in southern Lincoln and northern Clark Counties. Measures provided by NDOW in a November 1, 2007 publication entitled *Gila Monster Status, Identification and Reporting Protocol for Observations* are to be followed by the Proponent and their private contractors so as to minimize impacts on the Gila monster associated with the electric transmission facilities:

- Live Gila monsters found in harms way on the construction site will be captured and then detained in a cool, shaded environment (<85°F) by the project biologist or equivalent personnel until a NDOW biologist can arrive for documentation, marking and obtaining biological measurements and samples prior to releasing. Despite that a Gila monster is venomous and can deliver a serious bite, its relatively slow gate allows for it to be easily coaxed or lifted into an open bucket or box carefully using a long handled instrument such as a shovel or snake hook (*Note: it is not the intent of NDOW to request unreasonable action to facilitate captures; additional coordination with NDOW will clarify logistical points*). A clean 5-gallon plastic bucket w/ a secure, vented lid; an 18"x 18"x 4" plastic sweater box w/ a secure, vented lid; or, a tape-sealed cardboard box of similar dimension may be used for safe containment. Additionally, written information identifying the mapped capture location, Global Positioning System (GPS) coordinates in Universal Transverse Mercator (UTM) using the North American Datum (NAD) 83 Zone 11. Date, time, and circumstances (e.g. biological survey or construction) and habitat description (vegetation, slope, aspect, substrate) would also be provided to NDOW.
- Injuries to Gila monsters may occur during excavation, blasting, road grading, or other construction activities. In the event a Gila monster is injured, it should be transferred to a

veterinarian proficient in reptile medicine for evaluation of appropriate treatment. Rehabilitation or euthanasia expenses would not be covered by NDOW. However, NDOW will be immediately notified of any injury to a Gila monster and which veterinarian is providing care for the animal. If an animal is killed or found dead, the carcass will be immediately frozen and transferred to NDOW with a complete written description of the discovery and circumstances, date, time, habitat, and mapped location (GPS coordinates in UTM using NAD 83 Z 11).

- Should NDOW's assistance be delayed, biological or equivalent acting personnel on site will detain the Gila monster out of harms way until NDOW personnel can respond. The Gila monster should be detained until NDOW biologists have responded. Should NDOW not be immediately available to respond for photo-documentation, a digital (5 megapixle or higher) or 35mm camera would be used to take good quality images of the Gila monster in situ at the location of live encounter or dead salvage. The pictures will be provided to NDOW at the address above or the email address below along with specific location information including GPS coordinates in UTM using NAD 83 Z 11, date, time and habitat description. Pictures would show the following information: (1) Encounter location (landscape with Gila monster in clear view); (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster should fill camera's field of view and be in sharp focus); (3) a clear, overhead close-up of the head (head should fill camera's field of view and be in sharp focus).

<u>2. Greater Sage Grouse Mitigation Measures</u>

In order to minimize the possibility of disruption of mating strategies and unintentional take of greater sage grouse, the Proponent will employ the following:

- Outside of the designated SWIP corridor, construction activities will be restricted during the period from March 1 through May 15 within two miles of active greater sage grouse leks.
- Outside of the designated SWIP corridor, construction activities will be restricted from November 1 through March 31 within greater sage grouse winter range.
- In order to minimize an increase in predation of greater sage grouse, design features will be incorporated into the high-voltage (>200kV) electric transmission towers that will deter raptors and common ravens from utilizing the transmission towers as hunting facilitators. Non-lattice structures will be installed at locations within two miles of active leks and identified greater sage grouse winter range.

<u>3. Avian Wildlife Mitigation Measures</u>

For a complete list of protected birds see 50 C.F.R. 10.13.

A. Migratory Birds

- Land disturbing construction and vegetation clearing activities are to be scheduled outside of the breeding season (March 15 through July 30 - in upland desert habitats and ephemeral washes containing upland species and March 1 through August 30 - in riparian and higher elevation areas). Where construction is required during the breeding season, the area impacted is to be surveyed for nests prior to construction. If no nests are found, construction could proceed. Project area surveys will be done to ensure 100 percent coverage. Methods would be selected based on the plant community and/or

topography. Field notes and reports will thoroughly describe methodology and rationale for use and archived.

- If active migratory bird nests (i.e. contains eggs or young) are encountered during the surveys, land disturbing construction activities are to be avoided while the birds are allowed to fledge. An appropriate construction avoidance buffer area, to be determined for the species and in conjunction with the BLM, will apply to all active nests for migratory bird species.

B. Western Burrowing Owls and Ground Nesting Species

- Surveys will include burrowing owls and other ground nesting species. If active nests containing eggs and/or young were to be found, then an appropriately-sized buffer area will be established, marked and avoided during construction so that egg laying, incubation and the rearing of young continues until such time as the young fledge.
- For construction activities from October 1 to March 14, the Proponent's biologist will collapse all burrows, holes, crevices, or other cavities on the construction site only after thoroughly inspecting them for inhabitants, in accordance with agency protocols. This will discourage burrowing owls from potentially occupying the burrows, holes, crevices before and during construction activities.
- If burrowing owls are observed during surveys after March 15, the wildlife biologist is to be notified. The wildlife biologist will rely on behavioral observations to determine their breeding status. Should breeding behavior be observed, the wildlife biologist assumes that an active nest is present and the area will be avoided until the young fledge. This ensures that any eggs or young are not abandoned due to project activities. The owl's total nesting cycle takes a minimum of 74 days, during which time construction activity needs to cease within the buffer area on the site. Generally, owl eggs may be laid between mid-March to the end of May, and young may be present from mid-April through August. (Adapted from USFWS recommendations)

C. Raptors

- Raptor nests within the project area are to be identified during pre-construction surveys for migratory and ground-nesting birds. All active raptor nests are to be avoided. Known raptor nest sites need to be checked two to five days prior to construction activities in a given area. If an active raptor nest site is discovered, construction activities are to be restricted within 0.5 miles of the active nest site from May 1 through July 15.

4. <u>Big Game Mitigation/Management Action Measures</u>

The following Management Actions will be evaluated and potentially implemented for construction activities in specific big game habitats mapped outside the designated SWIP corridor as specified below:

A. Big Game Calving/Fawning/Kidding/Lambing Grounds and Crucial Summer Range

Construction activities are to be restricted within big game calving/fawning/kidding/lambing grounds and crucial summer range from April 15 through June 30.

B. Big Game Crucial Winter Range

Construction activities are to be restricted within crucial winter range from November 1 through March 31.

C. Desert Bighorn Sheep Habitat

Construction activities are to be restricted within occupied desert bighorn sheep habitat from March 1 through May 31 and from July 1 through August 31.

5. General Wildlife and Special Status Species Habitat

The loss of aquatic, priority wildlife, and/or special status species habitats will be mitigated on a ratio of two acres of comparable habitat for every one acre of lost habitat in areas outside the designated SWIP corridor.

4.8.2.6 Unavoidable Adverse Impacts on Wildlife Resources

The Proposed Action and Action Alternatives would permanently impact wildlife habitat at the power plant site and within portions of the long-term ROWs for the electric transmission facilities, water supply facilities, and rail facilities, depending on the alternatives chosen. **Tables 4.7-1** and **4.7-2** detail the permanent loss of wildlife habitats, as represented by the vegetation communities that would occur under the Proposed Action and each Action Alternative. This loss of habitat would be small compared to the available undisturbed wildlife habitat within the project area. These habitat losses could be replaced over decades if EEC operations and maintenance activities ceased and the project elements were removed.

Some long-term unavoidable adverse effects on wildlife populations would potentially occur as a result of mortalities during construction and operation activities.

4.8.2.7 Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources occurs if the commitment cannot be changed once made. There are no foreseeable irreversible commitments of wildlife resources associated with the EEC and its facilities.

An irretrievable commitment of resources occurs when resources are used, consumed, destroyed, or degraded during project construction, operation, and maintenance and cannot be reused or recovered for the life of the project or beyond. Both protected and general wildlife species within the project area may be subject to irretrievable commitment of resources with regard to the following types of disturbance: (1) disquieting and excessive noise, (2) increased human disturbance, (3) habitat loss and fragmentation, and (4) increased roads and vehicle traffic, for the life of the EEC or beyond.

4.8.2.8 Relationship of Short-term Uses and Long-term Productivity

Temporary disturbance and loss of habitat used by numerous species of wildlife could be considered a short term use. Most impacts to wildlife resources would initially result from construction activities and be temporary in duration, but some would persist for the operational life of the EEC.

4.8.3 North Plant Site Alternative

As stated in **Section 4.8.2**, the following categories of wildlife inhabit and/or forage within the majority of the project area for the North Plant Site Alternative and alternative components. Impacts to these species would be similar for all of the project features regardless of alternative. Unless otherwise noted, they will not be discussed under each specific project feature.

Bats: No known bat roosting areas are present within any of the project features within Steptoe Valley. However, bat roosting areas could be present within some of the transmission line ROWs. Construction activities (especially blasting for transmission

tower footings) in these areas could disturb bats. These impacts would be temporary and negligible. Bats likely use most of the project area for foraging opportunities. Construction activities could cause bats to temporarily abandon foraging within active work zones. No long-term adverse effects to bats are expected to occur from the operations, maintenance, or abandonment of any of the project's features or alternatives.

Migratory Birds: Several sensitive and common avian species utilize the project area for foraging and nesting. Construction activities would affect avian species that currently forage or nest in these areas causing these species to displace to adjacent undisturbed areas. Mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would greatly reduce the likelihood of avian species nesting behavior being directly impacted or disrupted and/or nests being destroyed.

Small Mammals, Predatory Mammals, and Reptiles: Common small mammals (i.e., black-tailed jackrabbits and ground squirrels), common predators (i.e., kit fox, coyote, and badger), and common reptile species (i.e., sagebrush and fence lizards) that are known to occur throughout the project area would be displaced into adjacent undisturbed lands during construction activities. However, some small and less mobile wildlife species would be killed or injured during these construction activities.

4.8.3.1 Direct and Indirect Effects on Wildlife Resources from Plant Site

Construction

Up to 2,979 acres of wildlife habitat would be impacted by the construction of the North Plant Site. Permanent disturbance would primarily impact greasewood, Douglas rabbitbrush, Wyoming sagebrush, and salt desert shrub communities (**Table 4.7-5**). The majority of this disturbance for the North Plant Site would be considered permanent as the life of the plant site is anticipated for 50 years.

Indirect effects include a small area of similar wildlife habitat that may be temporarily affected near the perimeter of the construction area, due to trampling or destruction of vegetation by construction equipment and materials staging. These temporarily-impacted areas would be revegetated with appropriate native species.

Impacts at the associated worker village would be short-term disturbance of 148 acres of Wyoming sagebrush habitat, lasting fewer than ten years until successful reclamation has occurred.

The Mt. Wheeler Transmission Line would extend from the Gonder substation north to the Lages Station Well Field private land, and it would affect primarily Wyoming sagebrush, Douglas rabbitbrush, greasewood, and disturbed communities (**Table 4.7-5**). These long-term and minor impacts would consist of permanent habitat disturbance from the switching substation, the small footprints of each pole structure, and any access roads within the ROW.

TEPC Species

No TEPC species were observed or are known to routinely inhabit the North Plant Site, associated worker village, or the Mt. Wheeler Transmission Line corridor. Thus no impacts to Federally Listed species are anticipated from the construction of these components of the project.

BLM Sensitive and State of Nevada Special Status Species

Only those species described in **Section 3.8** as having the potential to occur within the North Plant Site, the associated worker village, and the Mt. Wheeler Transmission Line ROW are discussed below.

Sage Grouse: The North Plant Site Alternative is situated in a portion of Steptoe Valley that is devoid of suitable sage grouse habitat. Therefore, no adverse impacts to sage grouse would be expected to occur due to the construction of the North Plant Site.

The Becky Spring Lek is located 1.4 miles from the associated worker village. It is currently unknown if this particular lek is active. US-93 acts as a partition between the worker village and this lek. It is unlikely that construction activities and operations would have any adverse effects on this lek. Thus, no impacts to sage grouse leks and/or mating strategies are anticipated to occur due to the construction of the associated worker village.

Impacts from the Mt. Wheeler Transmission Line to the North Tehama Creek Lek and the Whiteman Creek Lek would be similar to those described in **Section 4.8.2.1** under the Proposed Action.

Pygmy Rabbit: No pygmy rabbits were observed or are expected to occur within the North Plant Site. However, portions of suitable pygmy rabbit habitat were observed just north of the North Plant Site along the Mt. Wheeler Transmission Line and water supply pipeline ROW. Occupied and potential pygmy rabbit habitat exists within much of the Mt. Wheeler Transmission Line corridor ROW south of the North Plant Site, especially in drainages and swales where big sagebrush is present. Potential effects to pygmy rabbits from the construction of the Mt. Wheeler Transmission Line would be similar to those discussed in **Section 4.8.2.1**.

Raptors: Ferruginous hawk nesting habitat is located approximately 0.6 miles east of the North Plant Site. Many other types of raptors including hawks, owls, eagles, accipiters, and falcons currently utilize the North Plant Site, worker village, and the Mt. Wheeler Transmission Line for foraging activities. Construction activities at the North Plant Site are not expected to disturb the nesting behavior of ferruginous hawks in this area because they are likely habituated to vehicular traffic on US-93 and current mechanized agricultural practices on the private land.

Construction and human activities within the North Plant Site, worker village, and along the Mt. Wheeler Transmission Line would likely affect all raptor species that currently forage in the area, causing them to temporarily displace to adjacent undisturbed areas. This displacement would be temporary and negligible to minor except for the North Plant Site area. Mitigation measures (**Section 4.8.2.5**) would be employed prior to and during construction activities that would greatly reduce the likelihood of raptors being adversely affected. The Mt. Wheeler Transmission Line would increase the perching opportunities for raptors in the area.

General Wildlife

Only those general wildlife species described in **Section 3.8** as occurring or having the potential to occur based upon suitable habitats within the North Plant Site, the associated worker village, and the Mt. Wheeler Transmission Line ROW to the North Plant Site are discussed below.

Pronghorn Antelope: Development of the North Plant Site would disturb up to 2,979 acres; this represents approximately <0.05% of the available acres of year-round antelope range in the Steptoe Valley Watershed. Potential effects to pronghorn antelope would be similar to those discussed in **Section 4.8.2.1**.

Mule Deer: Impacts to mule deer habitat along the Mt. Wheeler Transmission Line would be similar to those described in **Section 4.8.2.1.**

Fisheries

No impacts to fisheries resources are anticipated from construction activities related to these project components, as they are not present within the project area and no drawdown impacts are anticipated as described in **Section 4.2**.

Operations, Maintenance, and Abandonment

TEPC Species

No TEPC species were observed or are known to routinely inhabit the North Plant Site, associated worker village, or the Mt. Wheeler Transmission Line corridor. Thus, no impacts to Federally Listed species are anticipated from the operations, maintenance, or abandonment of these components of the project.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse: The Becky Spring Lek would be located 1.4 miles from the associated worker village. Impacts to sage grouse would be similar to those described above, under *Construction* and in **Section 4.8.2.1** for the Mt. Wheeler Transmission Line.

Pygmy Rabbit: Effects to pygmy rabbits would be similar to those described in **Section 4.8.2.1**.

Raptors: As discussed above, ferruginous hawk nesting habitat is located approximately 1 mile east of the North Plant Site. This nesting area is partitioned off by US-93 and hawks nesting in this area are likely habituated to human disturbance. Therefore, no major effects to ferruginous hawks are anticipated from the operation, maintenance and abandonment of the North Plant Site. Impacts and mitigation measures concerning other raptors would be similar to those described in **Sections 4.8.2.1** and **4.8.2.5**.

General Wildlife

Pronghorn Antelope: As mentioned above, the entire North Plant Site, associated worker village, and the Mt. Wheeler Transmission Line occur within year-round pronghorn antelope range. Noise and human disturbance associated with operations, maintenance, or abandonment activities could occasionally disturb pronghorn antelope. However, the disturbance response of pronghorn would likely decrease in frequency and intensity as they would become habituated to the everyday disturbances associated with routine plant operations and maintenance.

Mule Deer: Potential effects to mule deer caused by the operations, maintenance and abandonment of the Mt. Wheeler Transmission Line would be identical to those described in **Section 4.8.2.1**.

4.8.3.2 Direct and Indirect Effects on Wildlife Resources from Electric Transmission Facilities

Construction

Construction of the electric transmission facilities for the North Plant Site would be similar to those described under the South Plant Site. Three additional electric transmission facilities segments are included in this discussion. These are Segments 1A, 1B, and 1C. Only one of either Segment 1A (alternative) or Segment 1B would be constructed. Segment 1C would be constructed as there are no alternatives to this segment.

The most common habitat types that would be affected by Segments 1A, 1B, and 1C are vegetation communities consisting of Wyoming big sagebrush, greasewood, Douglas rabbitbrush, and black sagebrush (see acreage impacts in **Tables 4.7-5** and **4.7-6**). Construction activity impacts to wildlife species would be the same as described in **Section 4.8.2.2**. Conditions within the remaining transmission line segments and substations would be the same as previously described in **Section 4.8.2.2**.

As stated previously, more sensitive wetland and riparian areas are present within various portions of the transmission line corridor ROWs as described in **Section 4.2** and **4.7**, but these habitats would be spanned by transmission lines and would not generally be impacted. Minor impacts to wetland habitats are anticipated under Alternative Segment 1A where it crosses Duck Creek, although BMPs would be implemented during construction to reduce and/or minimize potential impacts to wetland/aquatic habitats. Therefore, impacts to aquatic species or fisheries within the project area are anticipated to be minor during the construction of the transmission lines.

TEPC Species

Desert Tortoise: The desert tortoise is the only TEPC species that is known to occur within any of the electric transmission facilities. Potential effects to desert tortoise and mitigation measures concerning this species would be identical to those previously discussed in **Section 4.8.2.2**.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse: As described in **Section 4.8.2.2**, sage grouse habitat occurs throughout the project area for the electric transmission facilities. There are numerous leks within or less than 2 miles of the electric transmission facilities project area as shown on **Figure 3.8-2** and listed in **Table 4.8-6**. Only those leks that have not been previously discussed in **Section 4.8.2.2** are listed. Human disturbance associated with construction activities could disturb sage grouse during the breeding season. In order to minimize or eliminate these disturbances, transmission line construction within 2 miles of active leks would likely take place outside the sage grouse breeding season (March 1 through May 15) if the lek was determined to be active and within close enough proximity to construction activities to potentially cause an impact to breeding behavior. **Section 4.8.2.5** identifies additional mitigation measures that would be taken in order to minimize construction phase disturbance to sage grouse. Outside of the breeding season and within suitable sage grouse habitat, sage grouse using the project area would be displaced into adjacent undisturbed habitat and suitable habitat would be impacted.

TABLE 4.8-6. SAGE GROUSE LEKS AND PROXIMITY TO TRANSMISSION LINE SEGMENTS FOR THE NORTH PLANT SITE ALTERNATIVE

LEK NAME	ACTIVE/ NOT ACTIVE/ HISTORIC	APPROXIMATE DISTANCE FROM THE NEAREST TRANSMISSION LINE ROW
Borchert Spring N	Active	1.2 miles from Segment 1B (Line #1)
Raiff Siding	Unknown	0.5 miles from Segment 1B (Line #1)
Log Canyon N	Active	0.1 miles from Segment 1C (Line #1)
Mud Spring N	Active	0.1 miles from Segment 1C (Line #2)
Water Canyon Bench	Unknown	1.4 miles from Segment 1C (Line #1)
Dry Canyon 3	Unknown	0.5 miles from Segment 1D (Line #2)

Pygmy Rabbit: As applicable, effects and mitigation measures concerning pygmy rabbits would be the same as described in **Sections 4.8.2.2** and **4.8.2.5**.

Raptors: As applicable, effects and mitigation measures concerning raptors would be the same as those described in **Sections 4.8.2.2** and **4.8.2.5**.

Western Burrowing Owl: As applicable, effects and mitigation measures concerning burrowing owls would be the same as those described in **Sections 4.8.2.2** and **4.8.2.5**.

Terrestrial Invertebrates: Construction related impacts to terrestrial invertebrates would be the same as described in **Section 4.8.2.2**. However, the Segment 3 Transmission Line would not be constructed under the North Plant Site Alternative.

Aquatic Invertebrates: Several sensitive aquatic species have been located within Steptoe Valley (**Figure 3.8-3a**). The majorities of these species are located in isolated springs situated on the eastern foothills of the Egan Range and are not in close proximity to any of the proposed transmission lines. Therefore, no impacts to aquatic invertebrates are expected to occur due to the construction of electric transmission facilities for the North Plant Site Alternative.

<u>General Wildlife</u>

Mule Deer: Segment 1C is the only additional mule deer crucial winter range that would be impacted by the Alternative Action. Also, crucial winter range that Segment 3 is adjacent to would not be impacted under the Alternative Action. All other effects to mule deer, and mule deer crucial winter range would be the same as the effects discussed in **Section 4.8.2.2**.

Elk: Impacts to elk would be the same as those described in **Section 4.8.2.2**.

Bighorn Sheep: Impacts to bighorn sheep would be the same as those described in **Section 4.8.2.2**.

Waterfowl: Under the North Plant Site Alternative, the Segment 3 (alternative) would not be constructed. Avoidance of this area would reduce the impacts to waterfowl within Steptoe Valley, although alternative Segment 1A would cross Duck Creek and thus impacts to, and mitigation measures concerning, waterfowl would generally be the same as those described in **Sections 4.8.2.2** and **4.8.2.5**.

Operations, Maintenance, and Abandonment

General impacts to wildlife from operations, maintenance, and abandonment activities associated with the electric transmission facilities would be similar to those described in **Section 4.8.2.2**.

<u>TEPC Species</u>

Desert Tortoise: Potential effects to desert tortoise and mitigation measures concerning this species would be identical to those previously discussed in **Section 4.8.2.2**.

<u>BLM Sensitive and State of Nevada Special Status Species</u>

Sage Grouse: The effects of operations, maintenance and abandonment of the transmission line segments under the North Plant Site Alternative would be similar to the effects under the Proposed Action. Mitigation measures and BMPs associated with the transmission lines would be similar to those discussed in **Sections 4.8.2.2** and **4.8.2.5**.

Pygmy Rabbit: Effects and mitigation measures concerning pygmy rabbits would be the same as those described in **Sections 4.8.2.2** and **4.8.2.5**.

Raptors: Effects and mitigation measures concerning raptors would be the same as those described in **Sections 4.8.2.2** and **4.8.2.5**.

Western Burrowing Owl: Effects and mitigation measures concerning burrowing owls would be the same as those described in **Sections 4.8.2.2** and **4.8.2.5**.

<u>*General Wildlife*</u>

All of the effects to general wildlife due to operations, maintenance and abandonment of the North Plant Site Alternative electric transmission facilities would be the same as those discussed in **Section 4.8.2.2**.

4.8.3.3 Direct and Indirect Effects on Wildlife Resources from Water Supply Facilities

The North Plant Site Alternative includes a well field on private land near Lages Station, and a water supply pipeline extending from the well field south to the North Plant Site.

There are four water supply alternatives to the North Plant Site Alternative that include the following:

- Reduced Lages Station with Coyote Valley Ranch Well Field
- North Well Field
- Middle Well Field
- South Well Field

Construction

Direct effects from the construction of the Lages Station Well Field would be the same as described for the Proposed Action, except the water pipeline would be shorter in length, thus reducing overall wildlife habitat impacts.

As an alternative to the Lages Station Well Field water supply, the reduced Lages Station with Coyote Valley Ranch Well Field water supply would involve the same area and impacts for the North Plant Site Alternative as was described in **Section 4.8.2.3**.

Another water supply alternative, the North Well Field, would impact greasewood, rubber rabbitbrush, Wyoming sagebrush, and dune vegetation communities/wildlife habitats (see **Table 4.7-6**). These impacts would be long-term and minor.

Another water supply alternative, the Middle Well Field, would primarily impact greasewood and Wyoming sagebrush as well as four other communities in smaller amounts (**Table 4.7-6**). These impacts are expected to be long-term and minor, as the communities are common throughout Steptoe Valley. General construction related activity impacts would be the same as described in **Section 4.8.2.3**, with the exception of different acreage impacts.

Another water supply alternative, the South Well Field, would impact a total of ten different communities/wildlife habitats along the pipeline alignment (**Table 4.7-6**). These impacts are expected to be long-term and minor.

<u>*TEPC Species*</u>

No TEPC species were observed or are known to routinely inhabit the water supply facilities area. Thus, no impacts to Federally Listed species are anticipated from the construction these project features.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse: There are no known leks near the North Well Field Alternative and the Paine Springs Lek in Duck Creek Valley would not be impacted under the North Plant Site Alternative. All other effects and mitigation measures concerning sage grouse would be the same as described in **Sections 4.8.2.3** and **4.8.2.5**.

Pygmy Rabbit: Effects and mitigation measures concerning pygmy rabbits would be the same as those described in **Sections 4.8.2.3** and **4.8.2.5**.

Raptors: Effects and mitigation measures concerning raptors would be the same as those described in **Sections 4.8.2.3** and **4.8.2.5**.

Western Burrowing Owl: Effects and mitigation measures concerning burrowing owls would be the same as those described in **Sections 4.8.2.3** and **4.8.2.5**.

General Wildlife

Pronghorn Antelope: Impacts and mitigation measures for pronghorn antelope for the water supply facilities for the North Plant Site Alternative would be the same as those described in **Sections 4.8.2.3** and **4.8.2.5**.

Mule Deer: Impacts and mitigation measures for mule deer for the water supply facilities for the North Plant Site Alternative would be the same as those described in **Sections 4.8.2.3** and **4.8.2.5**. Crucial winter range in the Duck Creek Valley area would not be affected.

Waterfowl: Under the North Plant Site Alternative, the Duck Creek Impoundment and water supply line would not be developed, thus reducing potential impacts to waterfowl under the North Plant Site Alternative.

Operations, Maintenance, and Abandonment

TEPC Species

No TEPC species were observed or are known to routinely inhabit the water supply facilities area. Thus, no impacts to Federally Listed species are anticipated from the operations, maintenance, and abandonment of the water supply facilities.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse, Pygmy Rabbit, and Western Burrowing Owl: Displacement to these species due to operations, maintenance, and abandonment of the water supply facilities could occur during the life of the project.

Aquatic Invertebrates: Several sensitive aquatic species have been located within Steptoe Valley (**Figure 3.8-3a**). The majorities of these species are located in isolated springs situated on the eastern foothills of the Egan Range and are not in close proximity to any of the water supply facilities. In addition, as described in **Section 4.2**, drawdown impacts to springs that contain sensitive aquatic invertebrates are expected to be negligible. Therefore, no impacts to aquatic invertebrates are expected to occur due to the operation of the water supply facilities.

General Wildlife

Big Game: Pronghorn antelope and mule deer may experience disruption of normal behavior patterns due to operations, maintenance, and abandonment of the water supply facilities over the life of the project. No other major effects are expected to impact these species due to operations, maintenance, and abandonment of the water supply facilities.

Avian Wildlife: No significant effects are expected to impact avian wildlife due to operations, maintenance, and abandonment of the water supply facilities.

4.8.3.4 Direct and Indirect Effects on Wildlife Resources from Rail Facilities

Construction

TEPC Species

No TEPC species were observed or are known to routinely inhabit the rail facilities project area for the North Plant Site Alternative. Thus, no impacts to Federally Listed species are anticipated from the construction of these project features.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse: The Alternative Rail Line to the North Plant Site passes through a few areas of winter sage grouse habitat. However, there are no identified lek sites in these areas. Therefore, besides impacts to suitable sage grouse habitat, no major impacts to sage grouse are expected to occur due to the construction of the Alternative Rail Line to the North Plant Site.

Pygmy Rabbit: One recorded sign of pygmy rabbits was observed along the Alternative Rail Line approximately 2 miles north of US-93A. Pygmy rabbit habitat also exists where the Alternative Rail Line and rail lead enter the North Plant Site. As with other ground-dwelling species, pygmy rabbits could be directly affected by construction activities. Destruction of some pygmy rabbit burrows would be unavoidable and direct mortality of some members of this species could occur. These impacts could range from negligible to minor and would generally be short-term during the actual construction activities.

General Wildlife

Pronghorn Antelope: The proposed Alternative Rail Line and rail lead are located within pronghorn year-round range. Construction of rail facilities would likely cause pronghorn to temporarily avoid those areas. Displacement would be temporary and would not be expected to exceed a negligible level.

Operations, Maintenance, and Abandonment

TEPC Species

No TEPC species were observed or are known to routinely inhabit the rail facilities area. Thus no impacts to Federally Listed species are anticipated from the operations, maintenance, and abandonment of these project features.

BLM Sensitive and State of Nevada Special Status Species

Sage grouse: No significant long-term impacts to sage grouse are expected to occur from the operation, maintenance and abandonment of the rail facilities.

Pygmy Rabbit: Potential pygmy rabbit habitat exists within portions of the Alternative Rail Line corridor and the rail lead. Although pygmy rabbits are highly mobile, some members of this species could be killed by rail traffic. The number of potential pygmy rabbit fatalities caused by collisions with trains is presently unquantifiable. However, mortality rates are not expected to pose an additional threat to any local populations.

General Wildlife

Pronghorn Antelope: The Alternative Rail Line and rail lead are located within pronghorn year-round range. There are documented cases of trains colliding with antelope and antelope herds. However, in most of these incidences, the animals were trapped within the rail corridor by

fences. No long expanses of fencing are planned to be installed adjacent to the Alternative Rail Line or rail lead. Still, some members of this species could be killed through collisions with rail traffic. Pronghorn have demonstrated the capacity to habituate themselves to rail traffic. Mortality rates attributed to train collisions would likely decrease over time as pronghorn become familiar with rail traffic. It is anticipated that the local herds would eventually resume utilizing most of the range abandoned because of construction activities and rail traffic. Mortality rates are not expected to exceed a negligible level.

4.8.3.5 Mitigation

As applicable for the North Plant Site Alternative, mitigation measures for this alternative would be the same as those listed under the Proposed Action (**Section 4.8.2.5**).

4.8.3.6 Unavoidable Adverse Impacts on Wildlife Resources

The North Plant Site Alternative and Action Alternatives would permanently impact wildlife habitat at the power plant site and within portions of the long-term ROWs for the electric transmission facilities, water supply facilities, and rail facilities, depending on the alternatives chosen. **Tables 4.7-5** and **4.7-6** detail the permanent loss of wildlife habitats, as represented by the vegetation communities that would occur under the North Plant Site Alternative and each Action Alternative. This loss of habitat would be small compared to the available undisturbed wildlife habitat within the project area. These habitat losses could be replaced over decades if EEC operations and maintenance activities ceased and the project elements were removed.

Some long-term unavoidable adverse effects on wildlife would potentially occur as a result of mortalities during construction and operation activities.

4.8.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources for this alternative would be the same as those discussed under the Proposed Action (**Section 4.8.2.7**).

4.8.3.8 Relationship of Short-term Uses and Long-term Productivity

Short-term uses and long-term productivity for this alternative would be the same as those discussed under the Proposed Action (**Section 4.8.2.8**).

4.8.4 No Action Alternative

Under this alternative there would be no construction or operation of the EEC power plant or its facilities. Therefore, there would be no loss or modification of wildlife habitat and no direct or indirect impacts to wildlife.

4.9 Range Resources

4.9.1 Indicators and Methods

The proposed disturbances associated with the EEC Project would fragment certain allotments and HMAs and would affect forage resources within the project area. Access to water sources and the quality and quantity of water sources available within the direct and indirect effects area of allotments and HMAs could be affected.

The following indicators were considered when describing the affected environment for range resources:

- Total vegetation and forage production within the direct affects area

- Number of livestock allotments or HMAs that have one or more elements of the EEC project within them, and the numbers of livestock or horses currently using, or approved to use, these areas
- Locations of watering holes, springs, and other range improvements in relation to the direct affects area

These indicators were evaluated using the following criteria:

- Percentage of each HMA, or portion of each allotment in the project area that would be affected
- Number of AUMs or AMLs lost in each affected allotment or HMA
- Estimate of the type of forage lost on each affected allotment/HMA
- Number of acres of winterfat communities within each EEC element ROW
- Number of water sources that would be affected within, or within 2 miles of, EEC elements, and the number of other, alternative water sources available within the affected allotments or HMAs

The following methods were used to evaluate these criteria:

- Review soils and vegetation data contained in this EIS (**Sections 3.5** and **3.7**) and review forage production estimates found in the web-based NRCS Rangeland Productivity Information (NRCS Undated) for areas within and near EEC elements. Using this information, estimate changes to forage availability during EEC construction and operation for those EEC elements that are within allotments and HMA boundaries.
- Using GIS technology, map and measure the extent of EEC elements in acres or linear feet that are within affected allotment and HMA boundaries and determine the approximate total area of land that would be lost to forage production within allotments due to construction and/or operation of the EEC Project in both short- and long-term time frames.
- Using GIS technology, map BLM well and spring data and well data contained in **Section 3.2** of this EIS. Compare this to EEC element locations to evaluate whether access to water supplies would be affected by EEC elements.

4.9.2 Proposed Action: South Plant Site

4.9.2.1 Direct and Indirect Effects on Range Resources from Plant Site

Construction

Construction of the 2,970-acre South Plant Site would occur on land that is currently used for livestock grazing within two allotments: Duck Creek Flat and Steptoe. Each of these allotments has one permittee. Approximately 1,830 acres of the plant site would be located in the Duck Creek Flat allotment and 1,140 acres would be located in the Steptoe allotment. An additional 12 acres of disturbance within the Duck Creek Flat allotment would also occur from the access road to the worker village.

In addition, nine allotments would be crossed by the construction of a 69 kV power line that would provide power to the plant site area during construction activities, the worker village, and the Lages Station Well Field. However, only three of these allotments (West Schell Bench,

Schoolhouse Springs, and Gallagher Gap) would be affected outside of the plant site footprints and the water line corridor where the Mt. Wheeler Transmission Line would be located. This power line would run on the east side of U.S. 93 from the Gonder Substation, located south of Ely, to the South Plant Site (See **Figure 2-2** for location and alignment). Activities would include adding to existing power lines and installing new power lines. This action is described more fully in **Section 2.2.1.1**. The nine allotments that would be affected by power line construction include: Cherry Creek, Duck Creek Flat, Gallagher Gap, Middle Steptoe, North Steptoe, Schoolhouse Springs, Schellbourne, Steptoe, and West Schell Bench. Only the northern portion of the Mt. Wheeler ROW would cross through the Antelope HMA, within the Lages Station water line corridor described in **Section 4.9.2.3**.

Vegetation and Forage Production

Information taken on existing vegetation communities collected for this EIS is summarized in **Section 3.7**. These data indicate that approximately 1,586 acres (53.4%) of the South Plant Site area is dominated by a Douglas rabbitbrush community, 1,304 acres (43.9%) by a black sagebrush community, and 80 acres (2.7%) by a winterfat community. Based on the NRCS range production records, Indian ricegrass, needleandthread, and winterfat are the most prevalent forage species found on the South Plant Site. Construction on the 2,970-acre South Plant Site would result in loss of forage production for the life of the project, which is estimated to be 50 years or longer. This would be a loss of approximately 4.9 percent of the forage lands in the Duck Creek Flat Allotment, and 2.0 percent of the forage lands in the Steptoe Allotment. The effects to forage resources would be minor and long-term.

On BLM land, the Mt. Wheeler Transmission Line construction from the Gonder Substation to the South Plant Site would total approximately 47 acres of temporary disturbance and approximately 3 acres of permanent disturbance within the Gallagher Gap, Schoolhouse Springs, and West Schell Bench allotments, collectively. For comparison, the smallest of these allotments, Gallagher Gap, is 3,900 acres in size. This disturbance estimate is based upon an estimate of 9 miles of proposed transmission line on BLM land. Remaining disturbance on BLM land within allotments would occur within the plant site footprint and the water line ROW (disturbance acreage already accounted for). For structure construction disturbance only, approximately 5 acres per linear mile would be temporarily lost to forage production. Once construction activities were complete, permanent disturbance acreage would reduce to approximately 0.3 acres per linear mile after reclamation was successful. The effects to forage resources would be negligible and temporary during construction and negligible and long-term during operation.

Livestock Allotments

There is one permittee using the Duck Creek Flat Allotment and one permittee using the Steptoe Allotment. Livestock would be fenced out for the life of the project at the South Plant Site. Both of these allotments are fully utilized, and several nearby allotments have had decreases in AUMs over the last several years due to drought. There are no extra AUMs available on these lands. Based on NRCS total vegetation and forage production figures for the single soil map unit that covers the South Plant Site (see **Section 3.9.3** and **Tables 3.9-2** and **3.9-4**), construction of the South Plant Site would result in the loss of approximately 140 AUMs out of 1,321 (10.6%) from the Duck Creek Allotment and 87 AUMs out of 4,525 (1.9%) would be removed from the Steptoe Allotment The effects to livestock grazing would be minor and long-term.

Construction of the Mt. Wheeler Transmission Line would have a negligible effect on livestock allotments. No fencing would be constructed. The total area of the power line ROW is less than one percent of each allotment involved. The effects to livestock would be negligible and short-term.

Horse Management Areas

The South Plant Site is not within a HMA, and therefore any effect on the few wild horses and burros passing through the area would be negligible to none. The northern portion of the Mt. Wheeler Transmission Line would cross through the Antelope HMA, but within the Lages Station water line corridor addressed below. No adverse affects to HMAs are expected.

Water Sources

As stated in **Section 3.9.4**, there is one water source – a windmill and tank maintained by V&ST Enterprises LLC – recorded within the southern half of the Duck Creek Flat allotment, within the South Plant Site as shown on **Figure 3.9-1a**. Construction of the South Plant Site would eliminate livestock access to this water source.

The next available water sources are Tailings Creek and McGill Spring, about 6 miles to the south; Schoolhouse Spring, located about 6 miles southeast; and Duck Creek, which is somewhat ephemeral, located about 5 miles to the northwest. Cattle typically travel about 3 miles a day to get water. Supplying water via tanks and wells is a very effective tool for luring cattle to unused portions of pastures, and leads to more water uptake by cattle and better distribution and use of the forage resource (Ganskopp 2007). Cattle tend to concentrate near available water sources if water sources are far apart, leading to overgrazing of areas close to water (Griffith 1999). It is likely that closing access to the V&ST Enterprises LLC. well within the proposed South Plant Site would cause overgrazing of riparian areas near Schoolhouse Springs and Duck Creek, the only accessible water sources for the Duck Creek Flat allotment. This would lead to poorer forage utilization of upland areas. Drawdown of groundwater resources in the area immediately surrounding the South Plant Site during construction and operation is expected to be minimal as described in **Section 4.2.2.3**. The effects to livestock water supplies would be moderate and long-term.

Operations, Maintenance, and Abandonment

The effects on forage resources, allotments, HMAs, and water resources in the Duck Creek Flat and Steptoe Allotments during operations, maintenance, and abandonment of the EEC would be the same as those described in "Construction" above.

Operation and maintenance impacts to range resources along the Mt. Wheeler Transmission Line would be long-term and negligible as a result of maintenance activities.

4.9.2.2 Direct and Indirect Effects on Range Resources from Electric Transmission Facilities

Construction

Pre-construction surveying, soil testing, and flagging of roads and boundaries would occur months in advance of the start of construction. These activities would not create permanent roadways, trenches, or other land disturbances.

Construction mobilization, equipment yards, and other transmission line components as outlined in **Chapter 2** would include localized blading, cut-and-fill, leveling work, and excavation and foundation construction for transmission line structures. Temporary access roads and storage yards would be constructed within the ROW whenever possible. Approximately 420 acres of

storage yards and staging areas in 15-acre to 40-acre parcels within and outside of the transmission ROW would be needed, although the exact location of these yards is unknown at this time. Vegetation would be removed from these areas during their active use, eliminating forage production for the life of construction activities, which is estimated to be 18 to 24 months. Permanent fences would be constructed around the proposed 80-acre Robinson Summit Substation and around the 10 acres that would be permanently added to the existing Harry Allen Substation.

All water sources within the ROWs for the electric transmission facilities would likely be avoided, as there is flexibility in locating the actual structures and temporary work areas, thus eliminating potential disturbances to existing water sources used by livestock.

<u>Vegetation and Forage Production</u>

The proposed electric transmission facilities would pass over a wide range of plant communities as described in **Section 3.7**. The most common plant communities are Wyoming big sagebrush, creosote bush, Pinyon-Juniper, greasewood, and Douglas rabbitbrush. Together, these communities make up 77 percent of the ROW corridor for the electric transmission lines. Winterfat communities comprise less than one percent of the acres within the area of analysis. Vegetation and forage production for selected areas within the electric transmission facilities area are listed in **Table 3.9-8**, which represents common vegetation productivity rates for Ecological Sites found within the alignment. It is important to note that areas with high vegetation/forage production, such as the Saline Bottom Ecological Site (028BY004NV) listed for Segment 4A (800 pounds per acre total vegetation production and 600 pounds per acre forage production), are much less common than Ecological Sites such as the Gravelly Clay 10-12" P.z. Ecological Site (028BY086NV) listed in Segment 1D, or the Shallow Clay Loam, 10-12" P.z. Ecological Site (028BY089NV) listed in Segment 9B, whose production rates are more typically in the 300-500 pound per acre for total vegetation production, and less than 100 to roughly 200 pounds per acre for forage production. The value of the forage lost due to construction of the electric transmission facilities would depend on the exact location of transmission line structures and access roads, which would not be known until construction designs are available.

In an effort to provide some quantification of impacts from structure installation, since actual structure locations are unknown at this time, temporary disturbance during construction was estimated as 1 acre of temporary disturbance and 0.1 acre of permanent disturbance for every electric transmission line structure (approximately five structures per linear mile) in **Table 4.9-1** below. In addition, approximately 82 acres of permanent disturbance for the Robinson Summit Substation (includes access road) and 10 acres (30 acres temporary) of permanent disturbance at the Harry Allen Substation were considered. Disturbance for the Mt. Wheeler Transmission Line is included under the South Plant Site, above.

The overall success of revegetation efforts would depend on whether weeds or perennial species grew in after construction was complete. Adverse effects would occur where weedy species became established in areas previously containing significant amounts of perennial vegetation. Beneficial effects would occur where desirable forage species established in previously weedy areas. Total forage value of a successful seeding could equal or exceed pre-project forage production levels. The quality and magnitude of the effects of electric transmission facility construction on forage resources would be tied to the duration and season in which activities takes place on the ground, the productivity of the areas affected, and what vegetation, particularly forage species, persisted after construction.

Table 4.9-1 below provides a calculation of affected acres by allotment for the estimated number of structures per mile using the linear miles affected within each allotment for the Proposed Action and applicable action alternatives. In addition, the substation acreages are included within this table. Please refer to **Tables 3.9-6** and **3.9-7** to compare affected acreage with the total acreage of allotments that are within the electric transmission facilities area.

TABLE 4.9-1. ACRES OF DISTURBANCE BY ALLOTMENT FOR STRUCTURES WITHIN THE SOUTH PLANT SITE ELECTRIC TRANSMISSION FACILITIES

PROJECT ELEMENT	ALLOTMENT	LINEAR MILES AFFECTED	NUMBER OF STRUCTURES	DISTURBANCE (ACRES)	
				TEMPORARY	PERMANENT*
PROPOSED ACTION					
Segment 1D	MEDICINE BUTTE	3.87	19.4	19.4	1.9
	THIRTY MILE SPRING	17.16	85.81	85.8	8.6
	STEPTOE	7.80	38.99	39.0	3.9
	SOUTH BUTTE	8.47	42.35	42.4	4.2
	BUTTE SEEDING	2.81	14.06	14.1	1.4
Segment 1E	THIRTY MILE SPRING	0.79	3.97	4.0	2.3
Segment 4A	STEPTOE	26.06	130.30	130.3	13.0
Segment 6A	THIRTY MILE SPRING	1.13	5.66	5.7	0. 6
Robinson Summit Substation	THIRTY MILE SPRING	Not Applicable	Not Applicable	82.0	82.0
Segment 6C	THIRTY MILE SPRING	4.65	23.27	23.3	2.3
	BADGER SPRINGS	21.90	109.51	109.5	11.0
	INDIAN JAKE	7.40	37.02	37.0	3.7
	GIROUX WASH	27.80	139.01	139.0	13.9
	TOM PLAIN	17.65	88.23	88.2	8.8
	MCQUEEN FLAT	2.79	13.95	14.0	1.4
	DOUGLAS CANYON	4.65	22.75	22.8	2.3
	DOUGLAS POINT	8.37	41.84	41.8	4.2
	NORTH COVE	8.18	40.89	40.9	4.1
	HARDY SPRINGS	18.77	93.85	93.9	9.4
	COVE	9.76	48.78	48.8	4.9
	WELLS STATION	6.11	30.53	30.5	3.1
	WILSON CREEK	5.97	29.83	29.8	3.0
	SUNNYSIDE	14.69	73.46	73.5	7.3
	FOREST MOON	23.57	117.84	117.8	11.8
	FOX MOUNTAIN	22.98	114.89	114.9	11.5

PROJECT ELEMENT	ALLOTMENT	LINEAR MILES AFFECTED	NUMBER OF STRUCTURES	DISTURBANCE (ACRES)	
				TEMPORARY	PERMANENT*
Segment 8	WILSON CREEK	38.19	190.94	190.9	19.1
	SIMPSON	4.61	23.06	23.1	2.3
	ELY SPRINGS	14.18	70.92	70.9	7.1
	OAK SPRINGS	25.45	127.27	127.3	12.7
	CLIFF SPRINGS	22.02	110.10	110.1	11.0
	BUCKHORN	7.60	38.00	38.0	3.9
Segment 9D	BUCKHORN	14.48	72.42	72.4	7.2
	LOWER LAKE EAST	1.99	9.95	40.0	1.0
Segment 9B	BUCKHORN	21.56	107.82	107.8	10.8
Segment 9C - SPR #2	BUCKHORN	5	25	25	0.9
Segment 9C	LOWER LAKE EAST	2	8	8	1.0
Segment 9D	LOWER LAKE EAST	18.48	92.4	92.4	9.2
	DELAMAR	1.7	8.5	8.5	1.0
Segment 11	DELAMAR	10.56	52.80	52.8	5.3
	ARROW CANYON	28.81	144.03	144.0	14.4
	PITTMAN WELL	20.24	101.20	101.2	10.1
	DRY LAKE	15.36	76.81	76.8	7.7
Harry Allen Substation	DRY LAKE	Not Applicable	Not Applicable	40.0	10.0
ALTERNATIVES TO THE PROPOSED ACTION					
Segment 1G	THIRTY MILE SPRING	1.84	9.20	9.2	0.9
Segment 3	STEPTOE	10.51	52.53	52.5	5.33
	HEUSSER MOUNTAIN	7.40	36.99	37.0	3.7
	GOAT RANCH	7.84	39.18	39.2	3.9
Segment 10 - SPR #2	BUCKHORN	2	12.3	12.3	1.2
	DELAMAR	32	158.6	158.6	15.9
	GRAPEVINE	11	57.1	57.1	5.7

* Used 0.1 acre of permanent impact acreage/structure for calculation purposes

As committed to in **Section 2.2.2.2** *Construction Activities: Clearing and Grading*, after line construction, "all work areas identified as temporary disturbance on the structure location drawings would be restored." Full vegetation production takes about three to five years to establish after a range area has been re-seeded, thus, the duration of these effects would be considered short-term.

The quality and magnitude of these impacts would depend on the success of revegetation efforts, and whether seeded species take hold. The forage value of seeded lands would increase in areas where cheatgrass or other weedy species (e.g., halogeton, Russian thistle) are currently the dominant plants, and would remain roughly the same in areas where native, perennial vegetation is still dominant. If seeded species did not take hold and weedy species establish, the total vegetation production would decline and forage production and value of these lands would decline. However, given the total number of acres affected versus the total number of acres available (see discussion below), the over-all quality and magnitude of these impacts would be negligible to minor and short-term in duration.

Livestock Allotments

As noted in **Table 2.2-3**, potential temporary impacts during construction activities could total approximately 9,250 acres and permanent impacts could total approximately 1,000 acres (not all on public lands and within allotments). The total acreage of all allotments included in the project area for the Proposed Action is 3,052,856 acres. Thus, the total acreage temporarily and permanently lost from forage production due to construction of the electric transmission facilities would be approximately 0.3 percent and 0.03 percent, respectively of all allotment lands available. However, the effects on particular allotments would be greater or less, as further discussed below. The acreage in each allotment affected by the electric transmission facilities is listed in **Table 4.9-1** above. The total allotment acreage and AUMs per allotment are listed in **Table 3.9-6**.

The allotment with the most acres affected due to electric transmission facilities construction and operation is Wilson Creek. Electric transmission structures would temporarily impact approximately 221 acres in this 1,071,661 acre allotment. This is 0.02 percent of the acreage within the allotment, which supports 54,070 AUMs.

Based upon its relatively small overall size, the allotment with the highest proportion of acreage lost due to the electric transmission facilities construction is Butte Seeding (within Segment 1D), which would lose 0.9 percent of its acreage. This allotment supports 350 AUMs.

None of the allotments within the direct and indirect effects area in the Southern Nevada District Office boundary are active. This includes the Arrow Canyon, Pitmal Well, and Dry Lake allotments. The AUMs in these allotments have been relinquished. Thus, there would be no effects to livestock in these allotments.

No fencing of the electric transmission facilities would occur once construction is complete other than fencing at the Robinson Summit and Harry Allen Substations. Livestock would be able to access virtually all of the acreage within the electric transmission facilities ROW. Effects of electric transmission facilities construction on allotments would be negligible and short-term in duration once the majority of disturbed acreage is successfully reclaimed. Negligible long-term impacts would also occur from permanent disturbances.

Horse Management Areas

The total acreage of temporary impacts for structures within the electric transmission facilities for the Proposed Action that is within HMAs is about 872 acres and includes eight HMAs (See **Table 4.9-2** below). The total acreage of all HMAs included in the project area for the Proposed Action is 2,080,729 acres (see **Table 3.9-7**). This is a temporary loss of 0.04 percent of all of the acreage available to horses within only the HMAs. The permanent loss would total approximately 88 acres from the structures. However, the effects on particular allotments could be greater or less, as discussed below. The Segment 10 Alternative would result in an additional 54 acres of impacts from structures within the Delamar Mountains HMA.

TABLE 4.9-2. HMA ACRES OF DISTURBANCE FOR STRUCTURES WITHIN THE SOUTH PLANT SITE ELECTRIC TRANSMISSION FACILITIES

PROJECT ELEMENT	HMA	LINEAR MILES AFFECTED	NUMBER OF STRUC-TURES	DISTURBANCE ACRES		PERCENT OF HMA	
				TEMPO-RARY	PERMA-NENT*	TEMPO-RARY	PERMA-NENT
PROPOSED ACTION AND ACTION ALTERNATIVES							
Segment 1D	BUTTE	26.5	132.4	132.4	13.2	0.03%	0.00%
Segment 6C	JAKES WASH	54.8	273.9	273.9	27.4	0.18%	0.0[illegible]%
	WHITE RIVER	28.8	143.9	143.9	14.4	0.12%	0.01%
	DRY LAKE	13.1	65.5	65.6	[illegible].5	0.0[illegible]%	0.01%
	SEAMAN	22.4	112.0	112.0	11.2	0.03%	0.00%
Segment 8 – # 1 only	DRY LAKE	27.6	138.1	138.1	13.8	0.03%	0.00%
Segment 8 – #2 only	HIGHLAND PEAK	1.0	5.2	5.3	0.5	0.00%	0.00%
	DELAMAR MOUNTAINS	0.1	0.3	0.3	0.0	0.00%	0.00%
Segment 10 – # 2 only	DELAMAR MOUNTAINS	10.7	53.8	53.8	0.5	0.03%	0.00%

* Used 0.1 acre of permanent impact acreage/structure for calculation purposes

The HMA with the most acres affected and highest proportion of acres affected, is Jake's Wash. This HMA would temporarily lose 274 acres and permanently lose 27 acres of available forage as a result of structure installation. The HMA is 153,661 acres in size, thus this would be a 0.18 percent loss of forage.

Effects of construction on electric transmission facilities in HMAs would be negligible and short-term in duration once the majority of disturbed acreage is successfully reclaimed. Negligible long-term impacts would also occur from permanent disturbances.

<u>Water Sources</u>

All activities except those associated with equipment and staging areas would move steadily across the landscape of each HMA. If construction activities came near water supply locations, livestock or horses might be skittish of the activity and avoid these areas. Providing alternate water sources, such as tanks, while construction took place would potentially mitigate this impact.

Temporary access roads and electric transmission structure locations can be shifted to avoid direct impacts on springs or other range improvements and erosion control using effectively installed BMPs would protect nearby water sources. There would be negligible and transient effects on access to, and quality of, watering holes and range improvements. There would be no significant use of water in the construction and maintenance of power lines, thus no drawdown of water wells is expected. No effects to water quantity or quality that could result in adverse effects to water sources for range resources are predicted.

Operations, Maintenance, and Abandonment

Long-term periodic maintenance to the electric transmission lines may require access to the corridors via existing roads and may result in temporary disturbance; however, this effect would be minor to negligible to forage production, existing livestock allotments, HMAs and available water sources.

4.9.2.3 Direct and Indirect Effects on Range Resources from Water Supply Facilities

Those areas where pipelines would be constructed and maintained adjacent to the Alternative Rail Line are included within the railroad disturbance analysis. This analysis includes only those water supply facilities disturbances that are not connected to the Alternative Rail Line.

Construction

The water supply facilities pipeline construction ROW is generally 200 feet wide as illustrated in **Figure 2-6**. The information in **Table 4.9-3** below assumes that construction activities would affect the entire ROW. General activities include clearing of vegetation and minor land grading. Fences crossing the ROW would be cut and rebuilt. The pipeline trench would be excavated, spoil material and topsoil would be salvaged and temporarily stored to the side of the trench. After pipe placement, the trench would be backfilled, graded, and topsoiled, and the area would be seeded at the next appropriate season. A graveled roadway would be maintained adjacent to, or over, the buried pipeline and the long-term ROW would total 60 feet.

The extent of disturbance and the allotments affected for the construction of each well field and water pipeline for the Proposed Action and the Action Alternatives are listed in **Table 4.9-3** below.

TABLE 4.9-3. ACRES OF DISTURBANCE BY ALLOTMENT AFFECTED BY THE SOUTH PLANT SITE WATER SUPPLY FACILITIES

WATER SUPPLY FACILITY	ALLOTMENT	ALLOTMENT DISTURBANCE ACREAGE	
		TEMPORARY	PERMANENT
PROPOSED ACTION			
Lages Station Water Supply Line	Cherry Creek	301	91
	Duck Creek Flat	286	86
	Middle Steptoe	27	8
	North Steptoe	142	43
	Schellbourne	137	41
	Steptoe	145	44
TOTAL		**1038**	**313**
Lages Station Well Field and Pipeline	Private Land	NA	NA
ALTERNATIVES TO THE PROPOSED ACTION			
Duck Creek Impoundment & Pipeline^	Duck Creek Basin	8	2
	Gallagher Gap	38	11
	Steptoe	3	1
TOTAL		**49**	**14**

WATER SUPPLY FACILITY	ALLOTMENT	ALLOTMENT DISTURBANCE ACREAGE	
		TEMPORARY	PERMANENT
Reduced Lages with Coyote Valley Ranch Well Field and Water Supply Pipeline*	Cherry Creek	301	91
	Duck Creek Flat	285	85
	Middle Steptoe	27	8
	North Steptoe	142	43
	Schellbourne	137	41
	Steptoe	155	47
TOTAL		**1047**	**315**
Coyote Valley Ranch Well Field (private land) and Water Line*	Private Land	NA	NA
	Duck Creek Flat & Steptoe	8	2
TOTAL		**8**	**2**
Reduced Lages with Limited South Well Field and Water Supply Pipeline	Cherry Creek	301	91
	Duck Creek Flat	286	86
	Middle Steptoe	27	8
	North Steptoe	142	43
	Schellbourne	137	41
	Steptoe	145	44
TOTAL		**1038**	**313**
Middle Well Field and Water Supply Pipeline	Duck Creek Flat	285	85
	Middle Steptoe	27	8
	North Steptoe	128	38
	Schellbourne	137	41
	Steptoe	145	44
TOTAL		**722**	**216**
South Well Field and Water Supply Pipeline	Steptoe	91	28
	Duck Creek Flat	100	30
TOTAL		**191**	**58**

^ Portions would occur on private land or in county ROW
* Well Field would be partially located on private land and/or within water pipeline corridor

Vegetation and Forage Production

Construction of the water supply facilities would affect anywhere from 49 to 1,047 acres of allotments, depending on the water supply facility chosen. The majority of the water supply pipeline facilities are in upland areas dominated by Wyoming big sagebrush, Douglas rabbitbrush, rubber rabbitbrush, and greasewood, which make up over 90 percent of the vegetation. Winterfat communities make up 1.5 percent of the cover. The Duck Creek allotment has a higher ratio of forage grasses, but also has significant cover of noxious weeds (see Vegetation **Section 3.7**).

In a dry year, which has been the prevalent condition since the mid to late-1990's, total vegetation production on these lands ranges between about 250 and 600 pounds per acre in an average year. Forage production ranges between about 30 pounds per acre on a Sodic Terrace 5-8" P.z. Ecological Site located in the ROW of the North Plant Site Water Supply Line in the Cherry Creek allotment (028BY074NV), to about 300 pounds per acre on a Coarse Gravelly Loam 6-8" P.z. Ecological Site located along the Duck Creek Water Line in the Gallagher Gap

allotment (028BY075NV). At 1,000 pounds of forage per AUM, forage loss per acre of disturbance in these two allotments would range from a low of approximately 4 percent of one AUM to a high of about 17 percent of one AUM.

If pipe laying and reclamation of the corridor were completed between approximately October and April of any year, vegetation could re-grow within the next growing season. If pipe laying was completed during the summer months, vegetation would not begin re-growing until the following spring. Staging areas and well fields would be disturbed for the length of the construction period. Pipeline corridors would take less time to construct. Effects to vegetation and forage production would be negligible and short-term in duration once the majority of disturbed acreage is successfully reclaimed. Negligible long-term impacts would also occur from permanent disturbances from the permanent 60-foot wide ROW.

<u>Livestock Allotments</u>

The staging areas located along the pipeline corridor within Steptoe Valley under the Proposed Action and several of the alternatives would be disturbed for the entire construction period. If pipe laying occurred when there were no livestock on the allotments, effects would be negligible as there would be no disturbance to livestock movement, and vegetation would begin to grow back within that year. No pipeline ROW fences would be constructed, thus rangeland animals would have free access to the pipeline corridor, although livestock would likely tend to avoid the active construction areas. Reclamation of these lands would likely proceed faster if animals were kept off the land from the time they were topsoiled and/or seeded until plants established. Staging areas would likely take three to five years after reclaiming for vegetation to re-establish.

The total acreage and AUMs contained in each allotment effected by the various water supply alternatives are listed in **Table 3.9-10**.

If the Proposed Action – Lages Station Well Field and Water Supply Line – were developed, no public lands would be affected by the well field itself, but six allotments would be affected by the water supply line (**Table 4.9-3**). Up to 1,038 acres would be temporarily impacted during the construction phase, with the Cherry Creek allotment seeing the most acreage temporarily lost – 301 acres out of 173,205 acres, which supports 7,040 AUMs. Effects for this and other allotments would be, negligible to minor, and short-term for temporary impacts and long-term for the permanent impacts.

There are also five alternatives being considered for supplying water to the South Plant Site. If the Duck Creek Impoundment/Pipeline alternative were selected, no wells would need to be installed. However, the impoundment/dam would need to be re-worked to fit a new gravity-fed pipeline. The acreage disturbed for dam reconstruction is unknown at this time, but would all be situated on private land. Transporting water from the impoundment to the South Plant Site would require approximately 48 acres of public land for construction of a pipeline to the plant site. The pipeline would be largely within private and county lands, but would pass through the Duck Creek Basin, Gallagher Gap, and Steptoe allotments. The largest acreage loss would be in Gallagher Gap, which would lose 38 acres out of a total of 3,900 acres in the allotment during construction. This allotment supports 169 AUMs. Effects would be negligible to minor, and short-term for temporary impacts and long-term for the permanent impacts.

The Coyote Valley Ranch Well Field, if developed, would be located on private land. However, there would be a total of 8 acres of BLM ROW disturbed for construction of the pipeline from the well field in the Steptoe and Duck Creek Flat allotments. Effects would generally be negligible and short-term for temporary impacts and long-term for the permanent impacts.

If the Reduced Lages Station Well Field with Limited South Well Field alternative were developed, impacts would be identical to those described for the Proposed Action Lages Station Well Field and Pipeline.

If the Middle Well Field alternative were developed, approximately 722 acres out of 37,377 acres in the Duck Creek Flat allotment would be affected by construction. This allotment supports 1,321 AUMs. Effects would negligible and short-term for temporary impacts and long-term for the permanent impacts.

If the South Well Field alternative were developed approximately 91 acres out of 58,121 acres would be lost during construction and 28 acres would be lost permanently in the Steptoe allotment, and 100 acres out of 37,337 acres would be lost during construction and 30 acres would be lost permanently in the Duck Creek Flat allotment. These allotments support 4,525 and 1,321 AUMs, respectively. Effects would be negligible and short-term for temporary impacts and long-term for the permanent impacts.

Horse Management Areas

The Antelope HMA is the only HMA within the water supply facilities that would be affected by construction of any of the well fields or water pipelines. Less than one percent of the 400,333 acre HMA would be affected by construction activities if the Lages Station Well Field were utilized in any of the combinations noted in **Table 4.9-3**. All affected acres would be located near US-93, an area of the HMA typically avoided by horses. Effects of water supply facilities construction on wild horses would generally be negligible and short-term for temporary impacts and long-term and negligible for the permanent impacts.

Water Sources

There are three permitted stock water wells located within the modeled 50-year drawdown area of the water supply facilities. It is unknown if these wells are within the same aquifer that the water supplies for the EEC would be drawn from. If not, there would be negligible effects on livestock wells. If the wells draw from the same aquifer, the expected drawdown in feet for each well is listed in **Table 4.9-4** below. This table lists those wells that are registered with the Nevada State Engineer or the BLM. More detail on drawdown effects can be found in **Section 4.2**.

TABLE 4.9-4. STOCK WATERING FACILITIES WITHIN THE 50-YEAR DRAWDOWN AREA FOR THE SOUTH PLANT SITE WATER SUPPLY FACILITIES

WATER FACILITY	TOWNSHIP & RANGE	SECTION	QUARTER	MAXIMUM ESTIMATED DRAWDOWN AT WELLFIELDS				
				LAGES STATION	COYOTE VALLEY RANCH	NORTH	SOUTH	LIMITED SOUTH
Private – Barton Well	24N 64E	16	SW ¼	< 1 foot		1 Foot		
BLM – BLM Well	24N 64E	17	SE ¼	< 1 foot		1 Foot		
Private- V&ST Enterprises, LLC. Well	19N, 64E	17	SE ¼		2 feet		2 Feet	4 Feet

Effects of water supply facilities construction on water wells used for livestock located near the water supply facility corridor would be negligible.

Operations, Maintenance, and Abandonment

Periodic maintenance would occur for any of the water supply pipelines and would necessitate traveling through the various allotments along the proposed gravel road that would parallel the pipeline. Temporary displacement of livestock would likely occur during these times, if livestock were using the area. These impacts would be short-term and negligible.

Abandonment of the well field would include capping and plugging of wells and some grading and seeding of well pads. Pipelines would be buried in place and roads would be left as two-tracks with no additional reclamation work conducted. Traffic use would decrease due to cessation of inspections and servicing of the facility.

4.9.2.4 Direct and Indirect Effects on Range Resources from Rail Facilities

Construction

Construction of the rail lead from the NNRy to the South Plant Site would impact one allotment and no HMA and the Alternative Rail Line running from Shafter to the South Plant Site would affect 10 range allotments and three HMAs.

<u>Vegetation and Forage Production</u>

Construction of the rail lead from the existing NNRy to the South Plant Site would impact approximately 55 acres and pass through coarse silty to coarse gravelly soils. These rangelands are dominated by Douglas rabbitbrush with Wyoming big sagebrush, Indian ricegrass, basin wildrye, and winterfat also co-dominant species. As shown in **Table 3.9-14**, vegetative production during dry years, which is similar to current conditions, would typically be approximately 300-400 pounds per acre for Zerk, Heist, and Wintermute soils (028BY075NV, 028BY084NV, 028BY075NV) and an average forage production of 156-300 pounds per acre for these soils. Tosser soils (028BY016NV) are much drier and yield only 100 pounds of total vegetation and 40 pounds of forage in a typical dry year. The small acreage affected means construction of the South Plant Site Rail Lead would have negligible and short-term effects for temporary disturbances and negligible and long-term effects for permanent disturbances on vegetation and forage resources.

Construction of the Alternative Rail Line from Shafter to the South Plant Site would affect approximately 2,910 acres of BLM grazing land. Ecological sites within the alternative railroad ROW areas in Steptoe Valley are dominated by sandy to clayey loams and shallow calcareous slopes. Ecological sites include those listed above as well as alkali flats, such as the Ragtown Alkali Silt Flat (028BY97NV) (see **Table 3.9-1**). Productivity in dry years for total vegetation is roughly 200 pounds per acre, and for forage species is 30 pounds per acre. Some isolated bottom lands with high productivities are found as well, such as the Duffer Saline Bottom (028BY004NV), listed under Segment 4A in **Table 3.9-8**. Vegetation communities found within the ROWs that would be impacted for either the rail lead or the Alternative Rail Line are described in **Section 4.7** and impacts would be very similar to that described under **Section 4.9.2.3**, Vegetation and Forage Production, above.

Table 4.9-5 below lists the disturbance acres that would be affected during rail facilities construction and operation by allotment. The quality, magnitude, and duration of the loss of forage resources would be negligible and short-term.

TABLE 4.9-5. ACREAGE AND AUMS AFFECTED BY ALLOTMENT FOR THE SOUTH PLANT SITE RAIL FACILITIES

ALLOTMENT	DISTURBANCE ACRES	
	TEMPORARY	PERMANENT
RAIL LEAD		
Steptoe	**55**	**36**
ALTERNATIVE RAIL LINE*		
Big Springs	237	237
Spruce	486	486
Valley Mountain	208	208
Currie	356	356
Becky Springs	12	12
Cherry Creek	482	321
North Steptoe	213	142
Schellbourne	205	137
Middle Steptoe	41	27
Duck Creek Flat	424	283
Steptoe	247	188
TOTAL	**2,911**	**2,397**

*Acreage calculation assumes water line also occurs within ROW, some private land occurs near Shafter. Temporary and permanent disturbance is the same 200-foot ROW north of Lages Station.

Livestock Allotments

Of the 58,121 acres in the Steptoe allotment, approximately 55 acres would be temporarily lost during construction of the rail lead to connect the South Plant Site with the existing NNRy railroad and 36 acres would be affected permanently. As listed in **Table 3.9-6**, this allotment supports 4,525 AUMs.

The Alternative Rail Line would affect 2,911 acres out of 1,819,027 acres of grazing land in the affected allotments during construction, and 2,397 acres during operation. The allotment with the largest acreage affected within the Alternative Rail Line ROW is the Spruce Allotment, which would see approximately 486 acres of temporary and permanent disturbance during construction out of a total of 723,826 acres. This allotment supports 5,504 AUMs. The allotments with the highest proportion of land affected are Schellbourne and Duck Creek Flat allotments, which would each lose 1.1 percent of their lands due to construction activities, and 0.7 percent and 0.8 percent of their lands, respectively, during railroad operations.

Horse Management Areas

No HMAs would be disturbed if the rail lead were constructed between the existing NNRy and the South Plant Site.

Table 4.9-6 lists the three HMAs that would be affected by construction of the Alternative Rail Line from Shafter to the South Plant Site. The effects of losing these forage lands to railroad construction on horses would be negligible and long-term.

TABLE 4.9-6. HMAS AFFECTED BY THE SOUTH PLANT SITE RAIL FACILITIES

HMA	ACRES IN HMA	DISTURBANCE		PERCENT OF HMA AFFECTED	
		TEMPORARY	PERMANENT	TEMPORARY	PERMANENT
RAIL LEAD					
Not Within an HMA	NA	NA	NA	NA	NA
ALTERNATIVE RAIL LINE					
Goshute	267,277	174	174	0.01%	0.01%
Antelope Valley	502,914	620	620	0.12%	0.12%
Antelope	400,333	701	658	0.18%	0.16%

Water Sources

Livestock and wild horse access to water during construction could be affected in the following allotments: Spruce, Valley Mountain, Currie, and Cherry Creek. As described previously, cattle tend to congregate near water part of the day and then would travel 1 to 2 or more miles to access grazing areas. The location of the water sources in the vicinity of the Alternative Rail Line makes it likely that cattle would cross the railroad ROW to do this.

Water sources themselves could temporarily be affected by railroad construction activities due to siltation from dust generated from nearby construction activities, although the use of BMPs during construction, such as silt fences and dust suppression, would keep soil and any construction related water from entering nearby stock watering sources. Thus, this potential impact would be negligible.

There are no water wells located within 2 miles of the Alternative Rail Line ROW south of the North Plant Site. Thus, no impacts from construction activities related to this alternative are projected.

Operations, Maintenance, and Abandonment

Operation of the NNRy, plus the rail lead or the Alternative Rail Line to the South Plant Site would cause minor to moderate impacts of long-term duration to range and wild horse resources because parts of the railroad would disrupt established routes used by cattle and/or wild horses. Access to water during operation would be the most significant issue in the following allotments that have water sources near the Alternative Rail Line ROW: Spruce, Valley Mountain, Currie, Cherry Creek, North Steptoe, Middle Steptoe, Schellbourne, and Duck Creek Flat.

Cattle congregate in and around wells, and travel a few miles to access these water sources. In each case, this would require crossing the alternative railroad. Although not quantifiable, impacts could occur to livestock and wild horses through increased mortality, particularly with calves, due to livestock gathering on or close to the railroad tracks where they come close to watering areas. Impacts could range from negligible to major, depending on whether railroad construction separated livestock from their typical watering vs. grazing and resting grounds. Impacts could be major and long-term due to the loss of access to water. However, if cattle and/or wild horses were able to find or use water sources on the same side of the railroad as their grazing areas, impacts from operation would be lessened and minor to negligible.

4.9.2.5 Mitigation

1. The Proponents are to meet with affected livestock permittees to determine appropriate mitigation measures that could be applied to specific areas impacted by construction and operation of the proposed facilities.

4.9.2.6 Unavoidable Adverse Impacts on Range Resources

Construction activities would result in a net loss of rangeland available to livestock and wild horses for grazing. Reclamation of disturbed lands can result in poorer vegetation productivity than the native rangeland, although this is not always the case. In areas that are already degraded by weeds, perennial plant seedings in a good year can result in improved forage values. Implementation of potential mitigation measures that could be worked out between the Proponents and the affected permittees could reduce and/or minimize unavoidable adverse impacts on range resources, especially in regards to the loss of the V&ST Enterprises LLC. well within the South Plant Site, if a new well was drilled in adjacent undisturbed areas of the existing allotment.

4.9.2.7 Irreversible and Irretrievable Commitments of Resources

Available forage for livestock and wild horses within various allotments that would be removed or impacted in the long-term time frame of the Proposed Action would be an irreversible and irretrievable commitment of rangeland resources associated with the plant site, electric transmission facilities, water supply facilities, and railroad facilities. The amount of acreage permanently impacted would depend on the EEC elements ultimately approved/selected for the project. These losses would be replaced over decades if EEC operations and maintenance activities ceased, although not exactly the same. The NNRy railroad ROW is an example of the slow, but natural reclamation process that occurs if man-made structures are left un-maintained. This loss would be small compared to the available forage and rangeland resources within the analysis area.

The total number of stock watering facilities that would be eliminated due to construction and development of the EEC using the South Plant Site is at least one (V&ST Enterprises LLC. well). Other wells may be lost due to construction of the water supply line or the railroad, but it is likely that the wells can be avoided by adjusting the final facility alignment within the approved ROW. However, new wells could be drilled that would mitigate these water supply losses.

4.9.2.8 Relationship of Short-term Uses and Long-term Productivity

Most impacts on range resources would result from relatively short-term construction activities, although long-term impacts from project elements would persist for the operational life of the plant. This is compared to the longer-term productivity of increasing the regional supply of electrical power in Nevada.

4.9.3 North Plant Site Alternative

4.9.3.1 Direct and Indirect Effects on Range Resources from North Plant Site

Construction and operation of the 2,972-acre power plant facility would occur on land that is currently used for livestock grazing within the Cherry Creek allotment and the Antelope HMA.

Mt. Wheeler's proposal to provide power for the Proposed Action would still be applicable for construction activities at the North Plant Site as described in **Section 4.9.2.1**.

Construction

Vegetation and Forage Production

As described in **Sections 3.5 and 3.9**, soils at the North Plant Site consist of the Kunzler-Sycomat, Automal-Wintermute, and the Pyrat-Linoyer Associations. These soil map units range from sodic terraces, shallow calcareous loams, and coarse gravelly loams, to loamy and silty soils at lower elevations. As shown in **Table 3.9-4**, total vegetation production ranges from 200 to 400 pounds per acre, and forage production ranges from 30 to 245 pounds per acre in a dry year, which reflects current conditions in the area. The North Plant Site is within one 173,206-acre allotment that is shared by several permittees. Because the North Plant Site would be fenced, forage loss would be permanent. This would be an adverse, minor, and long-term impact to the forage resource.

Livestock Allotments

The North Plant Site would be fenced for the life of the operation. The 2,972-acre parcel would be unavailable for grazing for the life of the power plant, commencing with the beginning of construction activities. There are several permittees using the Cherry Creek allotment, which is fully utilized and thus there are no other AUMs available. Approximately 142 out of a total of 7,040 AUMs would be eliminated from livestock use. General effects of the forage loss, and methods of replacement of that forage, would be similar to those discussed under the South Plant Site, above, except that several permittees would be involved in any mitigation or re-distribution of livestock resources due to the forage loss. This would be a minor, long-term impact.

Horse Management Areas

The North Plant Site is within the Antelope HMA. This HMA is 400,333 acres in size and has a current population of 280 horses, with a target population of 324. The 2,972 acres that would be lost from forage production within this HMA is 0.7 percent of the HMA. These impacts would be negligible and long-term.

Water Sources

There are two water sources recorded on or within 1.5 miles of the North Plant Site. These are the BLM and Barton wells, which are located in T24N, R64E, Sections 16 and 17. These would be located outside of the plant site fence and thus would not be directly affected. Other water source locations are shown on **Figure 3.9-1a**. BMPs implemented during construction would minimize sediment laden water from reaching these wells. Thus, impacts to stock water sources from construction of the North Plant Site, if any occurred, would be negligible and transient.

Operations, Maintenance, and Abandonment

The effects on forage resources, allotments, HMAs, and water resources in the Cherry Creek allotment and Antelope HMA during operations, maintenance, and abandonment are the same as those described in *Construction,* above, and within **Section 4.9.2.1**, except for the differences in impact location, and allotments and HMAs affected.

4.9.3.2 Direct and Indirect Effects on Range Resources from Electric Transmission Facilities

Construction

Construction of the electric transmission facilities for the North Plant Site would be similar to those described under the South Plant Site with deletion of Segment 4A and the Segment 3 Alternative discussed in **Section 4.9.2.2,** and the addition of Segments 1A (Alternative), 1B, and 1C. Only one of either Segment 1A (Alternative) or Segment 1B would be constructed. Segment 1C would be constructed under the North Plant Site as there are no alternatives to this segment.

Vegetation and Forage Production

The most common plant communities that would be affected by Segments 1A (Alternative), 1B, and 1C are Wyoming big sagebrush, greasewood, and Douglas rabbitbrush, and black sagebrush. There are no winterfat communities within these segments. Vegetation and forage production for selected areas within the electric transmission facilities area listed in **Table 3.9-8.** The value of the forage lost due to construction of the electric transmission facilities would depend on the exact location of transmission line structures and access roads, which would not be known until construction.

As stated previously in **Section 4.9.2.2**, in an effort to provide some quantification of impacts from structure installation, since actual structure locations are unknown at this time, temporary disturbance during construction was estimated as one acre of temporary disturbance and 0.1 acre of permanent disturbance for every electric transmission line structure (approximately five structures per linear mile – rounded to the nearest mile) in **Table 4.9-7** below. Only estimated acreage disturbance for Segments 1A (Alternative), 1B, and 1C are listed, since all other impacts to applicable segments for the North Plant Site have been described in **Table 4.9-1** in **Section 4.9.2.2**. In addition, approximately 82 acres of permanent disturbance for the Robinson Summit Substation (includes access road) and 10 acres (30 acres temporary) of permanent disturbance at the Harry Allen Substation were considered and are applicable to the North Plant Site Alternative. Disturbance for the Mt. Wheeler Transmission Line is also included under the South Plant Site discussion, above.

Similar construction impacts to soils and vegetation as described previously would occur.

TABLE 4.9-7. ACRES OF DISTURBANCE BY ALLOTMENT FOR STRUCTURES WITHIN THE NORTH PLANT SITE ELECTRIC TRANSMISSION FACILITIES

PROJECT ELEMENT	ALLOTMENT	LINEAR MILES AFFECTED	NUMBER OF STRUCTURES	DISTURBANCE ACRES	
				TEMPORARY	PERMANENT
NORTH PLANT SITE ALTERNATIVE (NOT ALREADY DISCUSSED UNDER SOUTH PLANT SITE)					
Segment 1B	CHERRY CREEK	30	152	152	15.2
	GOLD CANYON	3	18	18	1.8
	MIDDLE STEPTOE	3	18	14	1.8
Segment 1C	GOLD CANYON	6	30	30	3.0
	MIDDLE STEPTOE	1	3	3	0.3
	DUCK CREEK FLAT	8	32	30	3.0
	STEPTOE	6	32	32	32
ALTERNATIVE (NOT ALREADY DISCUSSED UNDER SOUTH PLANT SITE)					
Segment 1A	CHERRY CREEK	19	93	93	12.0
	NORTH STEPTOE	8	41	41	5.3
	MIDDLE STEPTOE	3	15	15	1.9

The North Plant Site would follow the same commitments, and impacts would be affected by the same factors as are listed under **Section 4.9.2.2**.

Livestock Allotments

Segments 1A, 1B, and 1C would be located in portions of six allotments. These allotments are listed in **Table 4.9-7** above, and the acreage and total AUMs available in each of these allotments is listed in **Table 3.9-2**.

The allotment with the highest percentage of land disturbed during construction would be Cherry Creek under either Segment 1B or Alternative Segment 1A. Total temporary disturbance under Segment 1B for the structures would be less than one percent of the total land within this allotment. Effects to these allotments would be negligible and short-term in duration once the majority of disturbed acreage is successfully reclaimed. Negligible, long-term impacts would also occur from permanent disturbances.

Horse Management Areas

Approximately 62 acres of the Antelope HMA would be disturbed if Alternative Segment 1A was constructed and 43 acres would be disturbed if Segment 1B was constructed through this HMA. Either option represents less than one percent of the HMA. This would be a negligible, short-term effect once the majority of disturbed acreage is successfully reclaimed. Negligible, long-term impacts would also occur from permanent disturbances.

Impacts to other HMAs from construction activities for electric transmission facilities for segments applicable to the North Plant would be the same as described in **Section 4.9.2.2 and Table 4.9-2**, above.

Water Sources

There are 16 stock watering facilities within the electric transmission facilities corridors, mostly springs that have been identified within 2 miles of the electric transmission facilities. These are listed in **Table 3.9-9**. As there is some flexibility in locating power lines, structures, and access roads, it is unlikely that these water sources would be affected, thus no impacts are expected.

Operations, Maintenance, and Abandonment

Long-term periodic maintenance to the electric transmission lines may require access to the corridors via existing roads and may result in temporary disturbance. This effect would be minor to negligible to forage production, existing livestock allotments, HMAs and available water sources.

4.9.3.3 Direct and Indirect Effects on Range Resources from Water Supply Facilities

Impacts of construction activities and operation of the water supply facilities for the North Plant Site would be the same as described under the South Plant Site, above, except that the Duck Creek Impoundment and Limited South Well Field Alternatives would not be considered. In addition, the acreage affected within each allotment for each option would be slightly different than those listed under the South Plant Site. However, water supply facilities would follow the same corridor. Disturbance acreage for the various options are shown below in **Table 4.9-8.**

Vegetation and Forage Production

Vegetation and forage resources along the water pipeline corridors are described under the South Plant Site, water supply facilities, above. Total temporary disturbance would range from 785 acres if the Lages Station Well Field was developed in conjunction with the Coyote Valley Ranch Well Field and water supply pipeline, to 171 acres if the North Well Field and Water Supply Pipeline was developed. The acreage for each option is listed in **Table 4.9-8** above, and the total acreage and AUMs contained in each affected allotment is listed in **Table 3.9-10**. Effects would be similar to those described in **Section 4.9.2.3**. Impacts would be negligible to minor in magnitude and short-term in duration once the majority of disturbed acreage is

successfully reclaimed. Negligible, long-term impacts would also occur from permanent disturbances.

TABLE 4.9-8. ACRES OF DISTURBANCE BY ALLOTMENT AFFECTED UNDER THE NORTH PLANT SITE WATER SUPPLY FACILITIES

WATER SUPPLY FACILITY	ALLOTMENT	DISTURBANCE ACREAGE	
		TEMPORARY	PERMANENT
NORTH PLANT SITE			
Lages Station Water Supply Line	Cherry Creek	209	63
TOTAL		**209**	**63**
Lages Station Well Field and Pipeline	Private Land	NA	NA
NORTH PLANT SITE ALTERNATIVES			
Reduced Lages with Coyote Valley Ranch Well Field* and Water Supply Pipeline	Cherry Creek	235	71
	Duck Creek Flat	181	54
	Middle Steptoe	27	8
	North Steptoe	142	43
	Schellbourne	96	41
	Steptoe	104	31
TOTAL		**785**	**248**
North Well Field and Water Supply Pipeline	Cherry Creek	171	51
TOTAL		**171**	**51**
Middle Well Field and Water Supply Pipeline	Cherry Creek	27	8
	Duck Creek Flat	28	8
	Middle Steptoe	27	8
	North Steptoe	142	43
	Schellbourne	137	41
TOTAL		**361**	**108**
South Well Field and Water Supply Alternative	Cherry Creek	27	8
	Duck Creek Flat	286	86
	Middle Steptoe	27	8
	North Steptoe	142	43
	Schellbourne	137	41
	Steptoe	170	51
TOTAL		**789**	**237**

* Well Field would be partially located on private land and/or within water pipeline alignment.

Livestock Allotments

The largest acreage disturbance under any of the water supply facilities would occur to the Duck Creek Flat allotment with approximately 286 acres out of 37,377 acres in the allotment temporary disturbed due to construction of the South Well Field and Pipeline Alternative.

Horse Management Areas

Effects from the North Plant Site water supply facilities construction would be the same as those described under the South Plant Site, **Section 4.9.2.3**.

Water Sources

Effects of water supply facility construction on stock watering sources would be the same as those discussed under the South Plant Site, **Section 4.9.2.3**.

Operations, Maintenance, and Abandonment

Periodic maintenance would occur with any of the water supply pipelines and would necessitate traveling through the various allotments along the proposed gravel road that would parallel the pipeline. Temporary displacement of livestock would likely occur during these times, if livestock were using the area. These impacts would be short-term and negligible.

Abandonment of the well field would include capping and plugging of wells and some grading and seeding of well pads. Pipelines would be buried in place and roads would be left as two-tracks with no additional reclamation work conducted. Traffic use would decrease due to cessation of inspections and servicing of the facility.

4.9.3.4 Direct and Indirect Effects on Range Resources from Rail Facilities

Construction of the rail lead to the North Plant Site would impact one allotment and the Antelope HMA and the Alternative Rail Line running from Shafter to the North Plant Site would affect five range allotments and three HMAs. Activities and effects of construction and operation of the rail facilities for the North Plant Site would generally be the same as described under the South Plant Site, **Section 4.9.2.4**, except that only the Big Springs, Spruce, Valley Mountain, Currie, and Cherry Creek allotments would be affected.

Construction

Vegetation and Forage Production

The North Plant Site Rail Lead would impact approximately 205 acres. Impacts to vegetation would include greasewood, shadscale, inland saltgrass, alkali cordgrass, and Basin wildrye. As shown in **Table 3.9-14**, the rail lead would cross bottom lands associated with Duck Creek that are within Saline Meadow (020BY001NV), Saline Bottom (28BY004NV), and Sodic Flat (028BY069NV) Ecological Sites, as well as portions of upland areas. In a dry year, total vegetation production ranges from 150 to 800 pounds per acre, with forage production ranging from 26 to 600 pounds per acre. Low productivities are in Sodic Flats and high productivities are in meadow areas. The loss of this acreage would be negligible to minor compared to the total area forage resource, and short-term in duration once the disturbed acreage is successfully reclaimed. Negligible, long-term impacts would occur from the permanent disturbance.

Approximately 1,634 acres would be affected if the Alternative Rail Line were constructed between Shafter and the North Plant Site. The dominant plant communities affected would include Wyoming sagebrush, Douglas rabbitbrush, greasewood, and black sage with dominant forage grasses including Indian ricegrass, needlegrasses, and Basin wildrye. Total vegetation production would range from 200 to 400 pounds per acre, and forage production would range from 26 to over 100 pounds per acre in a dry year, depending on vegetation types. The loss of this acreage would be negligible to minor compared to the total forage resource, and long-term in duration.

Livestock Allotments

The North Plant Site Rail Lead would impact approximately 205 acres out of 173,206 acres in the Cherry Creek allotment, which supports a total of 7,040 AUMs. Effects of the rail lead construction would be negligible and long term.

Under the Alternative Rail Line, the Cherry Creek Allotment would see about 137 fewer acres affected than if the South Plant Site were developed. All other disturbance acreages listed in **Table 4.9-5** for the Alternative Rail Line would be the same. There would be no disturbance in the North Steptoe, Schellbourne, Middle Steptoe, Duck Creek Flat, or Steptoe allotments.

Horse Management Areas

The rail lead for the North Plant Site would occur almost entirely within the Antelope HMA. This would result in less than a 0.05 percent disturbance within this HMA. Impacts to HMAs from the Alternative Rail Line would be similar to those described in **Section 4.9.2.4**, as the same HMAs would be affected, except that no disturbance to the Antelope HMA south of the North Plant Site would occur. There would be negligible effects to the HMAs under the North Plant Site rail facilities.

Water Sources

Impacts would be similar to those described in **Section 4.9.2.4**.

Operations, Maintenance, and Abandonment

Operation of the NNRy, plus the rail lead or the Alternative Rail Line to the North Plant Site could cause minor to moderate impacts of long-term duration to range and wild horse resources because parts of the railroad would disrupt established routes used by cattle and/or wild horses. Access to water during operation would be the most significant issue in the following allotments that have water sources near the Alternative Rail Line ROW: Spruce, Valley Mountain, Currie, and Cherry Creek.

Cattle congregate in and around wells, and travel a few miles to access these water sources. In each case, this would require crossing the alternative railroad. Although not quantifiable, impacts could occur to livestock and wild horses through increased mortality, particularly with calves, due to livestock gathering on or close to the railroad tracks where they come close to watering areas. Impacts could range from negligible to major, depending on whether railroad construction separated livestock from their typical watering vs. grazing and resting grounds. Impacts could be major and long-term due to the loss of access to water. However, if cattle and/or wild horses were able to find or use water sources on the same side of the railroad as their grazing areas, impacts from operation would be lessened and minor to negligible.

4.9.3.5 Mitigation

1. The Proponents are to meet with affected livestock permittees to determine appropriate mitigation measures that could be applied to specific areas impacted by construction and operation of the proposed facilities.

4.9.3.6 Unavoidable Adverse Impacts on Range Resources

Unavoidable and adverse impacts on range resources would be the same as that described in **Section 4.9.2.6** above, except that the North Plant Site would result in 2,972 acres affected in the Cherry Creek Allotment and the Antelope HMA.

4.9.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of range resources would be the same as those described in **Section 4.9.2.7** as related to impacts associated with the North Plant Site Alternative.

4.9.3.8 Relationship of Short-term Uses and Long-term Productivity

The relationship of short-term uses and long-term productivity would be the same as that described in **Section 4.9.2.8** as related to impacts associated with the North Plant Site Alternative.

4.9.4 No Action Alternative

Under the No Action Alternative, there would be no project-related impacts to range resources.

4.10 Cultural Resources

4.10.1 Indicators and Methods

The term "historic property" is defined in the NHPA as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register of Historic Places (NRHP)"; such term includes artifacts, records, and remains which are related to such district, site, building, structure, or object. 16 U.S.C. Section 470(w)(5).

The following indicators were considered when analyzing potential impacts to historic properties (i.e. NRHP-eligible cultural resources):

- The number of NRHP-eligible sites impacted
- The projected number of acres of NRHP-eligible site area impacted
- Known historic features in or adjacent to project components
- The number of historic resources within the viewshed potentially impacted indirectly by the project

No TCPs, as defined in **Section 3.10**, have been identified in the project area. Therefore discussion of TCPs will not be carried forward in the impact analysis.

Assessment of potential effects or impacts on cultural resources is based on the NHPA regulations that define an effect as a direct or indirect alteration to the characteristics of a "historic property" that qualify it for inclusion in the NRHP. Adverse effects diminish the integrity of a property's location, setting, design, materials, workmanship, feeling, or association.

As defined in 36 CFR 800.5, adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

In accordance with the Programmatic Agreement, BLM, in consultation with the Nevada State Historic Preservation Office (SHPO), shall to the extent practicable ensure that effects to historic properties be avoided through project design, redesign, or relocation of facilities where feasible. When avoidance is not feasible an appropriate treatment plan shall be designed, in consultation with SHPO, to lessen or mitigate project-related effects to historic properties.

4.10.2 Proposed Action: South Plant Site

Where project-specific inventories were conducted, the number of NRHP-eligible sites potentially impacted have been presented. Where project-specific site data was not available, a quantified prediction of impacts to prehistoric and historic NRHP-eligible sites in acres was calculated based on sensitivity modeling conducted for this project (Carpenter et al. 2008). Due to the fact that the relatively few historic-period sites recorded near the project area are linear in nature, historic concerns are also assigned based on known historic sites present in or adjacent to project components.

Table 4.10-1 presents both specific and projected impacts to NRHP-eligible sites.

TABLE 4.10-1. CULTURAL RESOURCE IMPACTS UNDER PROPOSED ACTION SOUTH PLANT SITE

PROJECT COMPONENT	NRHP-ELIGIBLE SITES IMPACTED	PROJECTED ACRES OF PREHISTORIC NRHP-ELIGIBLE SITES	PROJECTED ACRES OF HISTORIC NRHP-ELIGIBLE SITES	OTHER CONCERNS
Plant Site				
South Plant Site	0	n/a	n/a	Steptoe Valley Historic Landscape
Associated Worker Village	0	n/a	n/a	
Mt. Wheeler Powerline	2	n/a	n/a	NNRy, Lincoln Hwy, Pony Express Trail
Electric Transmission Facilities[1]				
Segment 1D*	Unknown**	14.99 / 15.99	0.2 / 0.6	Lincoln Hwy, Granite Mining District
Segment 1E*	Unknown**	0.32 / 0.58	0.0 / 0.0	Lincoln Hwy
Segment 1G* (Alternative)	Unknown**	0.89 / 0.60	0.0 / 0.1	Lincoln Hwy
Segment 3* (Alternative)	0	n/a	n/a	NNRy
Segment 4A*	1	n/a	n/a	NNRy
Segment 6A	1	n/a	n/a	
Segment 6C	Unknown**	131.43 / 124.02	2.3 / 2.3	Midland Hwy, Currie Mining District, Ranching/Farming
Segment 8	Unknown**	3.47 / 3.5	0.0 / 0.0	

PROJECT COMPONENT	NRHP-ELIGIBLE SITES IMPACTED	PROJECTED ACRES OF PREHISTORIC NRHP-ELIGIBLE SITES	PROJECTED ACRES OF HISTORIC NRHP-ELIGIBLE SITES	OTHER CONCERNS
Segment 9A, Line 1	0	n/a	n/a	
Segment 9B	Unknown**	0.0 / 0.0	0.0 / 0.0	
Segment 9C, Line 2	Unknown**	0.0	0.0	
Segment 9D	Unknown**	47.88 / 46.22	0.0 / 0.0	Historic US-93
Segment 10 (Alternative, Line 2)	10	n/a	n/a	Historic US-93
Segment 11	Unknown**	22.08 / 21.84	0.0 / 0.0	
Robinson Summit Substation	2	n/a	n/a	
Harry Allen Substation Expansion	0	n/a	n/a	
Water Facilities				
Lages Station Well Field	Unknown**	16.32	0.0	
Coyote Valley Ranch Well Field (Alternative)	0	n/a	n/a	
Lages Station Water Line	11	n/a	n/a	Pony Express Trail
Duck Creek Water Line (Alternative)	2	n/a	n/a	Lincoln Hwy
Rail Facilities				
South Plant Rail Lead	1	n/a	n/a	NNRy
Alternative Rail Line	10[2]	n/a	n/a	NNRy, Pony Express Trail

[1]Two acreages indicates two transmission lines within ROW; SPR-1 and SPR-2, respectively. Source: Carpenter et al. 2008
[2]Alternative Rail Line would also include those sites under the Lages Station Water Line
* - Not all area was inventoried, modeled acreage of additional prehistoric eligible sites is provided
** - If component were selected, a Class III cultural resource inventory would be conducted prior to construction activities to determine presence of and impacts to NRHP-eligible cultural resource sites
n/a – Not applicable

4.10.2.1 Direct and Indirect Effects on Cultural Resources from Power Plant Site

Construction

No NRHP-eligible sites are located within the South Plant Site or associated worker village. Two NRHP-eligible sits are located along the Mt. Wheeler Transmission Line; these sites would be avoided by project design, if possible (**Table 4.10-1**). However, direct impacts to NRHP-eligible cultural resources (i.e. historic properties) could result. In addition, there would be potential for indirect impacts to cultural resource sites and historic resources due to visual intrusions to the historic landscape, increased access to remote areas, and subsequent potential for increased unauthorized collection/vandalism.

Historic resources including the NNRy and the Lincoln Highway would be in close proximity to the Mt. Wheeler Transmission Line. The Pony Express Trail would be crossed by the Mt. Wheeler Transmission Line if the Lages Station Well Field were selected and this is addressed in **Section 4.10.2.3** below as the transmission line would be located immediately adjacent to the water line and within the same ROW alignment. No adverse impacts would be anticipated to NRHP-eligible sites within the South Plant Site or the associated worker village; however. if NRHP-eligible sites were encountered mitigation measures are in place as outlined in the Programmatic Agreement; the sites would be avoided where possible or mitigated through data recovery approved by the agencies (i.e. BLM and SHPO). Impacts to the Pony Express Trail,

Lincoln Highway, or NNRy under the Mt Wheeler Transmission Line component would be mitigated through a SHPO-approved Treatment Plan.

Indirect impacts to historic resources (i.e., historic buildings, settlements, transportation routes) were considered in the form of the visual intrusion of the power plant (JRP 2007). The power plant at the South Plant Site would not have an adverse indirect visual effect on the individual NRHP-eligible historic resources (see **Table 3.10-2**) that contribute to the Steptoe Valley Historic Landscape, as project activities would not diminish the historic features of these resources or impair the characteristics that qualify them for the NRHP, nor would the project have physical contact with or be immediately adjacent to them. The introduction of a new visual element at various distances from the historic resources would not cause the setting of these individual resources to diminish to such a degree that the properties would no longer convey their significance, nor would these resources cease to contribute to the historic landscape. However, the power plant would have an adverse indirect visual impact on the Steptoe Valley Historic Landscape as a whole (JRP 2007). The adverse effect would be caused by the introduction of visual elements that diminish the integrity of design, setting, and feeling of the landscape by altering the patterns of spatial organization, land use, and transportation networks contributing to the landscape. The power plant would interrupt the visual linkage between contributing elements and would introduce a non-historic visual element into the landscape. This visual intrusion would adversely affect the characteristics (spatial organization, land use, transportation network) of the Steptoe Valley Historic Landscape that qualify it (make it eligible) for inclusion in the NRHP. Impacts would be moderate and long-term.

Operations, Maintenance, and Abandonment

No additional impacts to NRHP-eligible cultural resources from operations, maintenance, and abandonment of the South Plant Site, associated worker village, or Mt. Wheeler Transmission Line would be anticipated. However, the indirect effects described above would continue.

4.10.2.2 Direct and Indirect Effects on Cultural Resources from Electric Transmission Facilities

Construction

Robinson Summit Substation

There would be two NRHP-eligible sites impacted by the Robinson Summit Substation construction. The physical destruction of or damage to all or part of NRHP-eligible sites would destroy or diminish the characteristics that make them eligible for the NRHP. Impacts would be mitigated through data recovery studies and/or other appropriate treatment as described in the PA. Impacts would be minor and long-term.

Harry Allen Substation

No sites are present in the Harry Allen Substation expansion area. There would be no impacts to NRHP-eligible sites from expansion of the Harry Allen Substation. However, if NRHP-eligible sites were encountered mitigation measures are in place as outlined in the Programmatic Agreement; the sites would be avoided where possible or mitigated through data recovery approved by the agencies (i.e. BLM and SHPO).

Transmission Lines

Between 2 to 12 known NRHP-eligible cultural resource sites would be impacted and, based on the sensitivity analysis calculations (Carpenter et al. 2008), it is projected that approximately an additional 430 acres of prehistoric NRHP-eligible sites and 5.5 acres of NRHP-eligible historic sites would potentially be impacted under the Proposed Action transmission lines and

alternative segments (Segments 3 and 10). Historic concerns along the transmission lines include potential impacts to the Granite Mining District, NNRy, Lincoln Highway, Currie Mining District, Midland Highway, Ranches/Farming areas, Mining/Ranching areas, and the historic route of US-93. The physical destruction of or damage to all or part of eligible sites that cannot be avoided would destroy or diminish the characteristics that make them eligible for the NRHP. Projected acreages for NRHP-eligible site area potentially impacted are provided in **Table 4.10-1** by segment. However, transmission line tower placement could be modified to avoid and span eligible sites when possible. Prior to construction, the selected transmission corridors would be inventoried in their entirety for cultural resources. Impacts could potentially be avoided through construction design modification or mitigated through data recovery studies. Impacts would likely be minor to moderate and long-term.

Operations, Maintenance, and Abandonment

No additional direct impacts to NRHP-eligible cultural resources from operations, maintenance, and abandonment at the Robinson Summit Substation and the Harry Allen Substation would be anticipated.

Unless permanently fenced or otherwise protected, NRHP-eligible sites within the permanent transmission line rights-of-way could be inadvertently impacted during operation and maintenance of the transmission lines. Further, public access into these areas increases the potential for unauthorized artifact collection and vandalism at these sites.

4.10.2.3 Direct and Indirect Effects on Cultural Resources from Water Supply Facilities

Construction

Lages Station Well Field

Based on the sensitivity analysis calculations (Carpenter et al. 2008) as shown in **Table 4.10-1**, it is projected there would potentially be 16.32 acres of prehistoric and 0.0 acres of historic NRHP-eligible site area impacted by the Lages Station Well Field. There are no historic cultural resource concerns in this area. Impacts could potentially be avoided through construction design modification to avoid the sites or mitigated through data recovery studies. Impacts would be expected to be moderate and long-term.

Coyote Valley Ranch Well Field

No NRHP-eligible sites would be impacted by the Coyote Valley Ranch Well Field. There are no historic cultural resource concerns in this area. However, if NRHP-eligible sites were encountered, mitigation measures are in place as outlined in the Programmatic Agreement; the sites would be avoided where possible or mitigated through data recovery or other appropriate treatment as approved by the agencies (i.e. BLM and SHPO).

Lages Station Water Line (includes all potential alternatives that occur in same alignment)

Eleven NRHP-eligible sites would be impacted by the construction of the Lages Station Water Line (**Table 4.10-1**) to the South Plant Site. The water line would cross the Pony Express Trail. Impacts to eligible sites could potentially be avoided through construction design modification (i.e. bore under Pony Express Trail) or mitigated through data recovery studies or other appropriate treatment. Impacts would be minor to moderate and long-term.

Duck Creek Water Line

Two NRHP-eligible sites would be impacted by construction of this water line. Potential historic site impacts include the nearby Lincoln Highway which would be crossed by the Duck Creek

Water Line. Impacts to this site could be avoided by boring under this historic feature. Impacts would be negligible.

Operations, Maintenance, and Abandonment

No additional direct impacts to NRHP-eligible cultural resources during operations, maintenance, or abandonment of the water facilities would be anticipated.

Unless permanently fenced or otherwise protected, NRHP-eligible sites within the permanent water line rights-of-way could be inadvertently impacted during operation and maintenance of the water lines. Further, public access into these areas increases the potential for unauthorized artifact collection and vandalism at these sites.

4.10.2.4 Direct and Indirect Effects on Cultural Resources from Rail Facilities

Construction

South Plant Site Rail Lead

One NRHP-eligible site would be impacted by the construction of the South Plant Site Rail Lead. Historic site concerns would include potential impacts to the NNRy to which this rail lead would interconnect. Impacts would be negligible to minor and long-term. If NRHP-eligible sites were encountered, mitigation measures are in place as outlined in the Programmatic Agreement; the sites would be avoided where possible or mitigated through data recovery approved by the agencies (i.e. BLM and SHPO). Mitigation would likely be implemented to reduce potential impacts.

Alternative Rail Line

Ten eligible sites would be impacted from construction of the Alternative Rail Line between Shafter and the Lages Station area. In addition, the same sites included in the Lages Station Water Line from Lages Station to the South Plant Site would be impacted as they follow the same route. Historic site concerns include the NNRy which the Alternative Rail Line would interconnect with near Shafter to the north and the Pony Express Trail which the rail would cross. Direct construction disturbances to all or portions of eligible sites would adversely impact the integrity of those sites. The physical destruction of or damage to all or part of these eligible sites would destroy or diminish the characteristics that make them eligible for the NRHP. Impacts to eligible sites could potentially be mitigated through data recovery studies or other appropriate treatment as approved by the agencies. Impacts would be moderate and long-term.

Operations, Maintenance, and Abandonment

Alternative Rail Line and South Plant Site Rail Lead

No additional direct impacts to NRHP-eligible cultural resources during operations, maintenance, or abandonment of the South Plant Site Rail Lead or Alternative Rail Line would be anticipated.

Unless permanently fenced or otherwise protected, NRHP-eligible sites within the permanent Alternative Rail Line ROW could be inadvertently impacted during operation and maintenance of the rail line. Further, public access into these areas increases the potential for unauthorized artifact collection and vandalism at these sites.

Nevada Northern Railway

No direct impacts to NRHP-eligible cultural resource sites along the railway would be anticipated during operations, maintenance, or abandonment of the NNRy. Public access into

the ROW increases the potential for unauthorized artifact collection and vandalism at sites along the existing railroad.

4.10.2.5 Mitigation

1. If previously unidentified cultural resources are discovered, all EEC-related activities within 50 meters (165 ft) of the discovery shall cease immediately (EEC Programmatic Agreement). The Proponent or its authorized representative shall secure the location to prevent vandalism or other damage. The Proponent, or their authorized representative, shall notify the BLM Authorized Officer of the discovery within 24 hours by telephone followed by written confirmation. Activity at the location shall be suspended until after the discovery has been evaluated and any necessary mitigation measures completed and BLM has issued a written Notice to Proceed.
2. Any human remains, grave goods, items of cultural patrimony, and sacred objects, encountered during the undertaking are to be treated with the respect due such materials. Human remains and associated grave offerings found on public land are to be handled according to the provisions of NAGPRA and its implementing regulations (43 CFR 10). Human remains and associated grave offerings found on state or private land will be handled according to the provisions of Nevada statute NRS 383.

4.10.2.6 Unavoidable Adverse Impacts on Cultural Resources

Unavoidable or residual adverse impacts to NRHP-eligible cultural resource sites would include compromised site integrity and loss of data due to physical damage to the sites. Impacts would be mitigated to the extent possible through data recovery or other appropriate treatment prior to any construction activities through an approved treatment plan. The presence of upgraded public access roads could lead to increased casual visitation to nearby site locations resulting in greater vulnerability to site disturbance, unauthorized artifact collection, and vandalism.

4.10.2.7 Irreversible and Irretrievable Commitments of Resources

Any loss of context or destruction of NRHP-eligible or unevaluated cultural resource sites would constitute an irreversible commitment of that resource. This loss would be site-specific, as well as a loss of cumulative data on the local and regional level. Mitigation of impacts through data recovery would also constitute an irreversible commitment of that resource.

4.10.2.8 Relationship of Short-term Uses and Long-term Productivity

The short-term use of the area during project activities would result in adverse effects to cultural resource sites located within the project area. These impacts would be mitigated to the extent possible through data recovery or other appropriate treatment. The potential for inadvertent damage or destruction of cultural sites during construction, operation, maintenance, or associated activities, could result in the loss of significant information. Further, information and data retrieved through mitigation measures (i.e., data recovery) would represent short-term use of cultural resources at the expense of future research opportunities. Therefore, long-term productivity would be lost.

4.10.3 North Plant Site Alternative

The following table presents both the known sites and the projected acres of NRHP-eligible prehistoric and historic sites that could be impacted within the North Plant Site Alternative components, as calculated by the sensitivity analysis (Carpenter et al. 2008). The table also presents known historic site concerns.

TABLE 4.10-2. CULTURAL RESOURCE IMPACTS UNDER THE NORTH PLANT SITE ALTERNATIVE AND ASSOCIATED COMPONENTS

PROJECT COMPONENT	NRHP-ELIGIBLE SITES IMPACTED	PROJECTED ACRES OF NRHP-ELIGIBLE PREHISTORIC SITES	PROJECTED ACRES OF NRHP-ELIGIBLE HISTORIC SITES	OTHER CONCERNS
NORTH PLANT SITE				
North Plant Site	6	n/a	n/a	Steptoe Valley Historic Landscape
Associated worker village	0	n/a	n/a	
Mt. Wheeler Transmission Line	3	n/a	n/a	NNRy, Lincoln Hwy, Pony Express Trail
ELECTRIC TRANSMISSION FACILITIES[1]				
Segment 1A* (Alternative)	3	n/a	n/a	NNRy, Pony Express Trail
Segment 1B*	6	n/a	n/a	NNRy, Pony Express Trail
Segment 1C*	Unknown**	0.43 / 0.40	0.0 / 0.0	
Segment 1D	Unknown**	14.99 / 15.99	0.2 / 0.6	Lincoln Hwy, Granite Mining District
Segment 1E*	Unknown**	0.32 / 0.58	0.0 / 0.0	Lincoln Hwy
Segment 1G*	Unknown**	0.89 / 0.60	0.0 / 0.1	Lincoln Hwy
Segment 6A	1	n/a	n/a	
Segment 6C	Unknown**	131.43 / 124.02	2.3 / 2.3	Midland Hwy, Currie Mining District, Ranching/Farming
Segment 8	Unknown**	3.47 / 3.5	0.0 / 0.0	
Segment 9A* (Alternative)	0	n/a	n/a	
Segment 9B	Unknown**	0.0 / 0.0	0.0 / 0.0	
Segment 9C, Line 2	Unknown**	0.0	0.0	
Segment 9D	Unknown**	47.88 / 46.22	0.0 / 0.0	Historic US-93
Segment 10 (Alternative, Line 2)	10	n/a	n/a	Historic US-93
Segment 11	Unknown**	22.08 / 21.84	0.0 / 0.0	
Robinson Summit Substation	2	n/a	n/a	
Harry Allen Substation Expansion	0	n/a	n/a	
WATER FACILITIES				
Lages Station Well Field	Unknown**	16.32	0.0	
Lages Station Water Line (also North Well Field Alternative)	7	n/a	n/a	
Middle Well Field (Alternative)	Within Lages Water Line	n/a	n/a	Pony Express Trail
South Well Field (Alternative)	Within Lages Water Line	n/a	n/a	Pony Express Trail
Coyote Valley Ranch Well Field (Alternative)	0	n/a	n/a	

PROJECT COMPONENT	NRHP-ELIGIBLE SITES IMPACTED	PROJECTED ACRES OF NRHP-ELIGIBLE PREHISTORIC SITES	PROJECTED ACRES OF NRHP-ELIGIBLE HISTORIC SITES	OTHER CONCERNS
RAIL FACILITIES				
NNRy - North Plant Site Rail Lead	1	n/a	n/a	NNRy
Alternative Rail Line[2]	10+	n/a	n/a	NNRy

[1]Two acreages indicates two transmission lines within ROW; SPR-1 and SPR-2, respectively. Source: Carpenter et al. 2008
[2]Alternative Rail Line would also include those sites under the Lages Station Water Line
* - Not all area was inventoried, modeled acreage of additional prehistoric eligible sites is provided
** - If component were selected, a Class III cultural resource inventory would be conducted prior to construction activities to determine presence of and impacts to NRHP-eligible cultural resource sites
n/a – Not applicable

4.10.3.1 Direct and Indirect Effects on Cultural Resources from Plant Site

Construction

Impacts to 6 NRHP-eligible sites at the North Plant Site and 3 NRHP-eligible sites along the Mt. Wheeler Transmission Line would occur under this alternative. There is potential for impacts to NRHP-eligible historic sites, such as the NNRy, the Lincoln Highway, and the Pony Express Trail (discussed in **Section 4.10.2**) along the Mt. Wheeler Transmission Line. Direct construction disturbances to all or portions of NRHP-eligible sites would adversely impact their integrity. The physical destruction of or damage to all or part of eligible sites would destroy or diminish the characteristics that make them eligible for the NRHP. Impacts could potentially be avoided through construction design modification or mitigated through data recovery studies. Impacts would be moderate and long-term. Any NRHP-eligible site encountered would be subject to mitigation measures as outlined in the Programmatic Agreement; the sites would be avoided where possible or mitigated through data recovery approved by the agencies (i.e. BLM and SHPO).

Indirect impacts to historic resources would be essentially the same as that described under the South Plant Site (**Section 4.10.2)**, but shifted to the north.

Operations, Maintenance, and Abandonment

No additional impacts to NRHP-eligible cultural resources from operations, maintenance, and abandonment of the North Plant Site would be anticipated. However, the indirect effects described above would continue.

4.10.3.2 Direct and Indirect Effects on Cultural Resources from Electric Transmission Facilities

Construction

Robinson Summit Substation

Impacts to cultural resources from construction of the Robinson Summit Substation would be the same as those described in **Section 4.10.2.2**.

Harry Allen Substation

Impacts to cultural resources from expansion of the Harry Allen Substation would be the same as those described in **Section 4.10.2.2**.

Transmission Lines

Between 7 and 22 known NRHP-eligible sites and, based on the sensitivity analysis calculations (Carpenter et al. 2008), it is projected that approximately an additional 435 acres of NRHP-eligible prehistoric site area and 5.5 acres of NRHP-eligible historic site area would potentially be impacted under the North Plant Site Alternative transmission lines and alternative segments (Segments 1A, 9A, 9C, 10). Number of sites and projected acreages of NRHP-eligible sites impacted are provided in **Table 4.10-2**. Historic sites potentially impacted by transmission lines include the NNRy, the Pony Express Trail, the Lincoln Highway, Midland Highway, Historic US-93, Granite and Currie mining districts, and known historic ranching/farming areas. However, transmission line tower placement would be modified to avoid and span eligible sites when possible. Prior to construction, the selected transmission corridors would be inventoried in their entirety for cultural resources. Impacts could potentially be avoided through construction design modification or mitigated through data recovery studies. Impacts would likely be moderate and long-term.

Operations, Maintenance, and Abandonment

No additional direct impacts to NRHP-eligible cultural resources from operations, maintenance, and abandonment of the Robinson Summit Substation or the Harry Allen Substation would be anticipated.

Unless permanently fenced or otherwise protected, NRHP-eligible sites within the permanent transmission line rights-of-way could be inadvertently impacted during operation and maintenance of the transmission lines. Further, access into these areas increases the potential for recreational use impacts, unauthorized artifact collection, and vandalism at these sites.

4.10.3.3 Direct and Indirect Effects on Cultural Resources from Water Supply Facilities

Construction

Lages Station Well Field

Impacts to NRHP eligible sites from the Lages Station Well Field would be the same as those described in **Section 4.10.2.3**.

Coyote Valley Ranch Well Field

Impacts to NRHP eligible sites in the well field would be the same as those described in **Section 4.10.2.3**. Impacts along the associated water line (Lages Station Water Line route) heading north to the North Plant Site would include 8 NRHP-eligible sites.

Lages Station Water Line and North Well Field and Water Line

Seven NRHP-eligible sites would be impacted by construction of the Lages Station Water Line (**Table 4.10-2**) extending to the North Plant Site. There are no historic site concerns in this area. Impacts could potentially be avoided through construction design modification or mitigated through data recovery studies. Impacts would be moderate and long-term. The wells for the North Well Field could be located so as to avoid impacting any NRHP-eligible cultural resource sites. There would be no impacts to eligible cultural resource sites from placement of these wells.

Middle Well Field and Water Line

Impacts to one NRHP-eligible cultural resource site would occur under the from the Middle Well Field and Water Line to the North Plant Site.

South Well Field and Water Line

Impacts to 11 NRHP eligible sites would occur from the South Well Field and Water Line alternative. The Pony Express Trail would be crossed by this water line. Impacts from the water line could potentially be avoided through construction design modification (i.e. bore under Pony Express Trail) or mitigated through data recovery studies. Impacts would be negligible to minor and long-term.

Operations, Maintenance, and Abandonment

No additional direct impacts to NRHP-eligible cultural resources during operations, maintenance, or abandonment of the water supply facilities would be anticipated.

Unless permanently fenced or otherwise protected, NRHP-eligible sites within the permanent water line ROW could be inadvertently impacted during operation and maintenance of the water supply facilities. Further, public access into these areas increases the potential for artifact collection and vandalism at these sites.

4.10.3.4 Direct and Indirect Effects on Cultural Resources from Rail Facilities

Construction

North Plant Site Rail Lead

One NRHP-eligible site would be impacted by the North Plant Site Rail Lead. Historic concerns would include potential impacts to the NNRy to which this lead would connect.

Alternative Rail Line

Ten eligible sites would be impacted from construction of the Alternative Rail Line between Shafter and the Lages Station area. In addition, the same sites included in the Lages Station Water Line from Lages Station to the North Plant Site would be impacted as they follow the same route. Impacts could potentially be avoided through construction design modification or mitigated through data recovery studies. Historic site concerns would include potential impacts to the NNRy; the Alternative Rail Line would connect with the NNRy near Shafter. Direct construction disturbances to all or portions of eligible sites would adversely impact the integrity of those sites. The physical destruction of or damage to all or part of these eligible sites would destroy or diminish the characteristics that make them eligible for the NRHP. Impacts to eligible sites could potentially be mitigated through data recovery studies or other appropriate treatment as approved by the agencies. Impacts would be moderate and long-term.

Operations, Maintenance, and Abandonment

No additional direct impacts to NRHP-eligible cultural resources during operations, maintenance, or abandonment of the rail lead or the Alternative Rail Line would be anticipated. Unless permanently fenced or otherwise protected. NRHP-eligible sites within the permanent Alternative Rail Line ROW could be inadvertently impacted during operation and maintenance. Further, public access into these areas increases the potential for artifact collection and vandalism at these sites.

No additional impacts to NRHP-eligible cultural resources during operations, maintenance, or abandonment of the railroad would be anticipated.

4.10.3.5 Mitigation

Mitigation would be the same as that described under **Section 4.10.2.5** and in accordance with the Programmatic Agreement.

4.10.3.6 Unavoidable Adverse Impacts on Cultural Resources

Unavoidable or residual adverse impacts to cultural resource sites would include compromised site integrity and loss of data due to physical damage to the sites. Impacts would be mitigated to the extent possible through data recovery prior to any construction activities through an approved treatment plant. The presence of upgraded public access roads could lead to increased casual visitation to nearby site locations resulting in greater vulnerability to site disturbance, artifact collection, and vandalism.

4.10.3.7 Irreversible and Irretrievable Commitments of Resources

Any loss of context or destruction of NRHP eligible or unevaluated cultural resource sites would constitute an irreversible commitment of that resource. This loss would be site-specific, as well as a loss of cumulative data on the local and regional level. Mitigation of impacts through data recovery would also constitute an irreversible commitment of that resource.

4.10.3.8 Relationship of Short-term Uses and Long-term Productivity

The short-term use of the area during project activities would result in adverse effects to cultural resource sites located within the project area. These impacts would be mitigated to the extent possible through data recovery. The potential for inadvertent damage or destruction of cultural sites during construction, operation, maintenance, or associated activities, could result in the loss of significant information. Further, information and data retrieved through mitigation measures (i.e., data recovery) would represent short-term use of cultural resources at the expense of future research opportunities. Therefore, long-term productivity would be lost.

4.10.4 No Action Alternative

Under the No Action Alternative, the EEC and associated facilities would not be constructed and there would be no associated project impacts on NRHP-eligible cultural resource sites (historic properties) or historic resources.

4.11 Native American Concerns

4.11.1 Indicators and Methods

The analysis of potential impacts to Native American Concerns is based on a review of known tribal interests; traditional cultural places, trust assets/treaty rights resources, and consultation with the potentially affected Tribes (see **Section 3.11.3**).

There are 64 potential places of cultural and/or geographic interest to the Tribes within or near the project area. No formal or informal issues or concerns have been raised to date by the various Tribes regarding any religious or traditional cultural property concerns for the EEC project.

Impacts to prehistoric cultural resource sites are disclosed in **Section 4.10**. Consultation with the Tribes regarding impacts to NRHP-eligible prehistoric cultural resource sites is required under Section 106 of the NRHP.

4.11.2 Proposed Action: South Plant Site

4.11.2.1 Direct and Indirect Effects on Native American Concerns from Plant Site Construction

There would be no direct impacts to known places of potential cultural and/or geographic interest to the Tribes as a result of constructing the Proposed Action plant site, associated worker village, or associated Mt. Wheeler Transmission Line. However, there is one place of cultural and/or geographic interest located a few miles to the northwest of the Proposed Action plant site and west of the associated worker village. Indirect impacts to this place are unknown. Consultation with the Tribes is on-going. No concerns have been raised to date by the various Tribes.

The associated worker village is adjacent to the lands proposed to be transferred into trust for the Ely Shoshone Tribe. Potential indirect impacts to the proposed trust lands are unknown. No concerns have been raised to date by the Ely Shoshone Tribe.

Operations, Maintenance, and Abandonment

Operations and eventual closure of the Proposed Action plant site would have no direct or indirect effects on known places of cultural and/or geographic interest to the Tribes.

4.11.2.2 Direct and Indirect Effects on Native American Concerns from Electric Transmission Facilities

There would be no direct or indirect construction or operational impacts to known places of cultural and/or geographic interest to the Tribes along all segments of the Proposed Action transmission lines except where noted below.

Segment 3

There would be no direct impacts to known places of potential cultural and/or geographic interest to the Tribes. However, one place of interest is located to the south of this segment; it is unknown if there would be indirect impacts to this site. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

Segment 4A

One potential place of cultural and/or geographic interest to the Tribes is possibly located northeast of this segment. It is unknown if there would be indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

Segment 6C

There could be direct impacts to one potential place of cultural and/or geographic interest as well as possible indirect impacts to another three places located in the general vicinity of this segment. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

Segment 9A

One potential place of cultural and/or geographic interest to the Tribes is located near the southwest portion of this segment. It is unknown if there would be indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

Segment 9B

One potential place of cultural and/or geographic interest to the Tribes is located near the southwest portion of this segment. It is unknown if there would be indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

Segment 9D

One potential place of cultural and/or geographic interest to the Tribes is located near the southwest portion of this segment. It is unknown if there would be indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

Segment 10

One potential place of cultural and/or geographic interest to the Tribes is located near this segment. It is unknown if there would be indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

Segment 11

One potential place of cultural and/or geographic interest to the Tribes is located near this segment. It is unknown if there would be indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

Robinson Summit Substation

There would be no direct or indirect impacts to known places of cultural and/or geographic interest to the Tribes at the proposed Robinson Summit Substation.

Harry Allen Substation

One potential place of cultural and/or geographic interest to the Tribes is located near the substation. It is unknown if there would be indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

4.11.2.3 Direct and Indirect Effects on Native American Concerns from Water Supply Facilities

There would be no direct or indirect impacts to known potential places of cultural and/or geographic interest to the Tribes resulting from construction or operation of the Proposed Action Lages Station Well Field or any of the alternative water supplies with the possible exception discussed below.

Coyote Valley Ranch Well Field

There would be no direct impacts to known places of potential cultural and/or geographic interest to the Tribes. However, this well field would be adjacent to the lands recently transferred into trust for the Ely Shoshone Tribe. It is unknown if there would be any indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

4.11.2.4 Direct and Indirect Effects on Native American Concerns from Rail Facilities

There would be no direct or indirect impacts to known potential places of cultural and/or geographic interest to the Tribes from construction or operation of the Alternative Rail Line or the rail lead.

There would be no direct impacts to known potential places of cultural and/or geographic interest to the Tribes from operation of the NNRy. However, there are three known places of

potential cultural and/or geographic interest to the Tribes located near the NNRy corridor; it is unknown if there would be any indirect impacts. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

The Wells Band expressed concern about the potential impacts of the rail facilities on woodland resources, such as the pine nut harvest, and access within the Elko District. However, the rail line would not cross through any woodland habitat so it would not affect woodland resources. Design of the rail line would accommodate existing roads which would be carried over the track with rail crossings; therefore there would not be an impact on the continued use of these roads to access public lands on either side of the rail line.

4.11.2.5 Mitigation

1. If previously unidentified cultural resources are discovered, all EEC-related activities within 50 meters (165 ft) of the discovery are to cease immediately and the Proponent or its authorized representative shall secure the location to prevent vandalism or other damage (Programmatic Agreement). The Proponent, or their authorized representative, shall notify the BLM Authorized Officer of the discovery within 24 hours by telephone followed by written confirmation. Activity at the location shall be suspended until after the discovery has been evaluated and any necessary mitigation measures completed and BLM has issued a written Notice to Proceed.
2. Any human remains, grave goods, items of cultural patrimony, and sacred objects, encountered during the undertaking will be treated with the respect due such materials. In coordination with the Programmatic Agreement, human remains and associated grave offerings found on public land will be handled according to the provisions of NAGPRA and its implementing regulations (43 CFR 10). Human remains and associated grave offerings found on state or private land will be handled according to the provisions of Nevada statute NRS 383.

4.11.2.6 Unavoidable Adverse Impacts on Native American Concerns

There would be no unavoidable adverse impacts on Native American Concerns.

4.11.2.7 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible or irretrievable commitments of resources of Native American Concern.

4.11.2.8 Relationship of Short-term Uses and Long-term Productivity

In the short term, there would be no impacts to known Native American concerns. There would not be impacts to long-term productivity.

4.11.3 North Plant Site Alternative

4.11.3.1 Direct and Indirect Effects on Native American Concerns from Plant Site

There would be no direct or indirect impacts to known places of potential cultural and/or geographic interest to the Tribes as a result of the construction, operations, maintenance, and abandonment of the North Plant site, the associated worker village, or the associated Mt. Wheeler Transmission Line. No concerns have been raised to date by the Tribes.

4.11.3.2 Direct and Indirect Effects on Native American Concerns from Electric Transmission Facilities

The impacts of the construction, operations, maintenance, and abandonment of the transmission facilities would be similar to those described above in **Section 4.11.2.2** with addition of the segments below.

<u>Segment 1A</u>

There would be no direct or indirect impacts to known potential places of cultural and/or geographic interest to the Tribes along Segment 1A.

<u>Segment 1B</u>

There would be no direct impacts to known potential places of cultural and/or geographic interest to the Tribes along Segment 1B. However, four places of interest are located several miles to the west; it is unknown if there would be indirect impacts to these sites. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

<u>Segment 1C</u>

There could be direct and/or indirect impacts to one potential place of cultural and/or geographic interest to the Tribes and possibly indirect impacts to another place of interest located to the east of this segment. Consultation with the Tribes is ongoing. No concerns have been raised to date by the Tribes.

4.11.3.3 Direct and Indirect Effects on Native American Concerns from Water Supply Facilities

The impacts of the construction, operations, maintenance, and abandonment of the water supply facilities would be similar to those described above in **Section 4.11.2.3**.

4.11.3.4 Direct and Indirect Effects on Native American Concerns from Rail Facilities

The impacts of the construction, operations, maintenance, and abandonment of the Alternative Rail Line or the rail lead would be the same as those described above in **Section 4.11.2.4**.

There would be no impacts to Native American concerns from the operations, maintenance, and abandonment of the NNRy under the North Plant Site Alternative.

4.11.3.5 Mitigation

No mitigation has been proposed since there are no impacts to Native American concerns. If mitigation were deemed necessary, it would be in accordance with the Programmatic Agreement.

4.11.3.6 Unavoidable Adverse Impacts on Native American Concerns

There would be no unavoidable adverse impacts on Native American Concerns.

4.11.3.7 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible or irretrievable commitments of resources of Native American concern.

4.11.3.8 Relationship of Short-term Uses and Long-term Productivity

In the short term, there would be no impacts to known Native American concerns. There would not be impacts to long-term productivity.

4.11.4 No Action Alternative

No EEC related impacts on Native American concerns would occur under the No Action Alternative.

4.12 Land Use

4.12.1 Land Use Plans and Policies

The BLM Land Use Plans that apply to the project area (i.e., Wells, Ely, and Las Vegas RMPs in **Section 3.12.3.1**) all acknowledge the need for ordered land disposal programs and tend to favor a balanced approach to land management that protects fragile resources but doesn't overly restrict the development of other resources for economic goods and services. None of the action alternatives analyzed in this EIS appear to conflict with the management goals and objectives of the current RMPs and the Caliente Management Framework Plan (MFP) and Desert Tortoise Amendment.

County land use plans for the southern counties (i.e., Lincoln and Clark) tend to be more developed than those in the northern part of the project area (i.e., Elko, White Pine, Nye). This is indicative of the greater growth and population in the south, particularly in Clark County. The location of proposed ROWs would not conflict with any county zones or land use designations.

4.12.2 Land Use and Ownership

The dominant land uses in the project area is livestock grazing/ranching, hunting, and recreation. The public lands administered by the BLM are managed for multiple-use. Impacts of the EEC to BLM grazing allotments are discussed under Range Resources in **Section 4.9**. Impacts of the EEC to recreation, and hunting as a form of recreation, are discussed in **Section 4.14**. While mining is not a dominant land use within the project area, there are numerous mining claims in the project area (**Section 3.3**) and impacts of the EEC on these claims are discussed in **Section 4.3**.

4.12.3 Indicators and Methods

Impacts on land use caused by project construction or operation were evaluated by determining the potential for:

- Conflicts with existing federal, state, and local land uses, plans and policies
- Conflicts with existing BLM land use authorizations
- Changes in public land disposition

4.12.4 Proposed Action: South Plant Site

4.12.4.1 Direct and Indirect Effects on Land Use from Plant Site

No land use authorizations are located within the South Plant Site. However, the plant site is located adjacent to existing BLM land use authorizations. These are primarily in the form of ROWs for transmission lines, roads, telephone and fiber optic facilities, water facilities, recreation or public purpose leases, airport leases, and material sites for road construction.

Under the Proposed Action, up to approximately 2,500 acres of public land in White Pine County would be disposed of and become privately owned for the plant site. This is a negligible change compared to the 5.7 million acres owned by the federal government in White Pine

County. Transferring the parcel from public to private ownership could limit the continuation of existing land uses on the fenced site to certain prior existing rights. In addition, an approximately 500-acre ROW would also be required for the plant site. It is anticipated that a total of 2,970 acres of public land and no private land would be impacted as a result of the land disposal and ROW for the plant site. The associated worker village would be located entirely on private land (150 acres). However, a short (0.5 mile) ROW for an access road and the Mt. Wheeler Transmission Line would be required on public land administered by the BLM.

An additional 69-kV transmission line by Mt. Wheeler Power would be necessary for plant construction and start up, the associated worker village, and the well fields. The Mt. Wheeler Transmission Line would originate at the Gonder Substation and head north on the east side of US-93 to a new substation just north of the Duck Creek Road. The line would then head due west and cross US-93 to join the SE corner of the South Plant Site. The Mt. Wheeler Transmission Line would include 15.3 miles of rebuilt lines, all of which are located east of US-93 and are located on privately owned or BLM lands. The new line would be constructed across 9.0 miles of BLM land and 3.2 miles on City of McGill and privately owned lands.

Construction

Prior to construction, the Federal Aviation Administration (FAA) would be consulted regarding potential interference of navigable air space for Yelland Field. As of the date of this document, it is unknown whether the proposed stack height or other ancillary facilities associated with the plant site would interfere with navigable air space.

Approximately 47 acres of public land administered by the BLM would be required for a short-term construction ROW for the Mt. Wheeler Transmission Line.

There would be no additional construction-related impacts to land use or allocations beyond those already noted above or presented in specific resource sections including **Sections 4.3.2** (Geology), **4.9.2** (Range), **4.14.2** (Recreation), and **4.20.2** (Transportation).

Operations, Maintenance, and Abandonment

No additional impacts to land use would occur as the result of ongoing operations and maintenance of plant facilities. The Mt. Wheeler Transmission Line would require a long-term ROW of 47 acres. After the new line was built and energized, portions of the line that were upgraded on mainly private land north of McGill would be removed.

4.12.4.2 Direct and Indirect Effects on Land Use from Electric Transmission Facilities

The proposed transmission lines cross or are adjacent to several BLM land use authorizations. These are primarily in the form of ROWs for transmission lines, roads, and telephone and fiber optic facilities and include the following large right-of-way holders: Mt. Wheeler Power, Sierra Pacific Power, Idaho Power, Nevada Power, Nevada Bell, Lincoln County Telephone, BLM, and NDOT. Because transmission line spans can be modified to avoid potential impacts, no adverse effects to existing ROWs are anticipated.

Table 4.12-1 compares the long-term ROW to the amount of private land that would be affected as a result of granting the ROWs for the transmission lines.

TABLE 4.12-1. TRANSMISSION FACILITY ROWS AND PRIVATE LAND USE ACREAGE

ELEMENT	LONG-TERM BLM ROW (ACRES)	PRIVATE, STATE, OR OTHER AGENCY LANDS AFFECTED (ACRES)
Robinson Summit Substation, includes 50-foot wide access road	82	0
Alternative Segment 3 (Lines 1 & 2)	502	29
Segment 4A (Lines 1 & 2)	632	0
Segment 1D (Lines 1 & 2)	988	0
Segment 1E (Lines 1 & 2)	24	0
Segment 6A (Lines 1 & 2)	24	0
Segment FG (Lines 1 & 2)	30	0
Segment 6C (Lines 1 & 2)	4,962	19
Segment 8 (Lines 1 & 2)	2,708	18
Alternative Segment 9A (Line 1)	196	0
Segment 9B (Line 1 & 2)	526	0
Segment 9C (Line 2)	160	0
Segment 9D (Lines 1 & 2)	938	4
Alternative Segment 10 (Line 2)	1,114	0
Segment 11 (Lines 1 & 2)	1,870	0
Harry Allen Substation Expansion	10	0

Construction

Prior to construction, the FAA would be consulted regarding potential interference of commercial and Air Force military training air space. As of the date of this document, it is unknown whether the proposed transmission towers would interfere with the use of air space adjacent to the ROWs.

During transmission line stringing, it may be necessary to erect temporary structures over major roadways. Access beneath these structures would remain largely unrestricted, with few temporary closures or other alterations to existing transportation routes.

There would be no additional construction-related impacts to land use beyond those already noted above or presented in specific resource sections including **Sections 4.3.2** (Geology), **4.9.2** (Range), **4.14.2** (Recreation), and **4.20.2** (Transportation).

Operations, Maintenance, and Abandonment

No additional impacts to land use would occur as the result of ongoing operations and maintenance of electric transmission facilities.

4.12.4.3 Direct and Indirect Effects on Land Use from Water Supply Facilities

The water supply facilities and alternatives under the Proposed Action cross or are adjacent to several BLM land use authorizations. These are primarily in the form of ROWs for transmission lines, roads (including those for private access), mineral material sites, and telephone and fiber optic facilities and include the following large ROW holders: Mt. Wheeler Power, Nevada Bell, BLM, and NDOT. No changes in adjacent land uses are anticipated.

Table 4.12-2 compares the long-term ROW to the amount of private land that would be affected as a result of granting the ROWs for the water supply facilities.

TABLE 4.12-2. LONG-TERM WATER SUPPLY FACILITY ROWS AND PRIVATE LAND USE ACREAGE

ELEMENT	LONG-TERM BLM ROW (ACRES)	PRIVATE, STATE, OR OTHER AGENCY LANDS AFFECTED (ACRES)
Lages Station Well Field and Pipeline	0	102
Lages Station Water Supply Line	320	28
Alternative Duck Creek Impoundment/Pipeline	44	26
Alternative Reduced Lages w/Coyote Valley Ranch	320	28
Alternative Reduced Lages w/Limited South Well Field	320	102
Alternative Middle Well Field	218	0
Alternative South Well Field	58	0

Construction

There would be no additional construction-related impacts to land use beyond those already noted above or presented in specific resource sections including **Sections 4.3.2** (Geology), **4.9.2** (Range), **4.14.2** (Recreation), and **4.20.2** (Transportation).

Operations, Maintenance, and Abandonment

A construction access road (two-track, approximately 10 feet wide) along the length of the pipeline would be maintained for inspection and maintenance crews after installation. Each pumping well would have a permanent graveled area of approximately 0.1 acre (25 feet X 25 feet) around the well head.

No additional impacts to land use would occur as the result of ongoing operations and maintenance of water supply facilities.

4.12.4.4 Direct and Indirect Effects on Land Use from Rail Facilities

The Alternative Rail Line and associated rail lead to the plant site, would cross or be adjacent to several BLM land use authorizations in Steptoe and Goshute Valleys. These are primarily in the form of ROWs for transmission lines, roads (including those for private access), road construction material sites, and telephone and fiber optic facilities and include the following large land holders: Mt. Wheeler Power, Nevada Bell, BLM, and NDOT. The Alternative Rail Line would not encounter any ROWs to the north of US-93. No changes in adjacent land uses are anticipated.

Similarly, rail leads that would connect the plant site to the NNRy would also cross or be adjacent to BLM land use authorizations in Steptoe Valley.

A BLM ROW would be required for the Alternative Rail Line. The rail line may be constructed with or without the water pipeline within the ROW south of Lages Station. If the Alternative Rail Line and water line share the ROW, it would be approximately 2,440 acres in size with an additional 45 acres of private lands near Shafter and the Lages Station area. Without the water pipeline, the long-term ROW would be approximately 2,418 acres with an additional 43 acres of private land affected.

Construction

There would be no additional construction-related impacts to land use beyond those already noted above or presented in specific resource sections including **Sections 4.3.2** (Geology), **4.9.2** (Range), **4.14.2** (Recreation), and **4.20.2** (Transportation).

Operations, Maintenance, and Abandonment
No additional impacts to land use would occur as the result of ongoing operations and maintenance of the rail line.

4.12.4.5 Mitigation

Additional mitigation measures are not required.

4.12.4.6 Unavoidable Adverse Impacts on Land Use

Unavoidable adverse impacts on land use under the Proposed Action include the permanent disposal of 2,477-acre parcel from public to private ownership that would limit the continuation of existing land uses (e.g., recreation, grazing) on the fenced site to certain prior existing rights. Granting ROWs for various project elements would also change the land use of those parcels.

4.12.4.7 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible commitments of land use allocations. The loss of existing land use of the affected parcels constitutes an irretrievable commitment.

4.12.4.8 Relationship of Short-term Uses and Long-term Productivity

Most impacts on land uses in the project area would result from land disposition or ROWs granted. These changes in land use are compared to the longer-term productivity of increasing the regional supply of electrical power in Nevada.

4.12.5 North Plant Site Alternative

4.12.5.1 Direct and Indirect Effects on Land Use from Plant Site

Under the North Plant Site Alternative, up to approximately 2,500 acres of public land in White Pine County would become privately owned. This is a negligible change compared to the 5.7 million acres owned by the federal government in White Pine County. Transferring ownership of the parcel from public to private ownership would limit the continuation of existing land uses on the fenced site to certain prior existing rights. In addition, an approximately 500-acre ROW would be required for the North Plant Site. It is anticipated that 2,972 acres of public land and no private land would be impacted as a result of the land disposal and ROW for the plant site. The associated worker village would be located entirely on private land (150 acres). Utilities for the associated worker village would be within previously described ROWs or situated on private land.

Construction
Impacts would be the same as those described under the Proposed Action in **Section 4.12.4.1**, and presented in specific resource sections including **Sections 4.3.2** (Geology), **4.9.2** (Range), **4.14.2** (Recreation), and **4.20.2** (Transportation), as the Mt. Wheeler Transmission Line would occur in the same location as for the South Plant Site and the line north would occur within the water line ROW discussed in **Section 4.12.4.3**.

Operations, Maintenance, and Abandonment
Impacts would be the same as those described under the Proposed Action in **Section 4.12.4.1**.

4.12.5.2 Direct and Indirect Effects on Land Use from Electric Transmission Facilities

The impacts on land use would be very similar to the Proposed Action in **Section 4.12.4.2** except for the different acreages listed in **Table 4.12-3,** which details the acreages of long-term

ROWs and the amount of private or other agency land that would be affected as a result of the alternative.

TABLE 4.12-3. ALTERNATIVE LONG-TERM TRANSMISSION FACILITY ROWS AND PRIVATE LAND USE ACREAGE

ELEMENT	LONG-TERM BLM ROW (ACRES)	PRIVATE, STATE, OR OTHER AGENCY LANDS AFFECTED (ACRES)
Robinson Summit Substation, includes 50-foot wide access road	82	6
Alternative Segment 1A (Lines 1 & 2)	720	0
Segment 1B (Lines 1 & 2)	392	63
Segment 1C (Lines 1 & 2)	484	0
Segment 1D (Lines 1 & 2)	392	0
Segment 1E (Lines 1 & 2)	24	0
Segment 6A (Lines 1 & 2)	24	0
Segment 6A (Lines 1 & 2)	30	0
Segment 6C (Lines 1 & 2)	4,962	19
Segment 8 (Lines 1 & 2)	2,708	18
Alternative Segment 9A (Lines 1 & 2)	392	0
Segment 9B (Line 1)	263	0
Segment 9C (Line 2)	160	0
Segment 9D (Line 1)	935	0
Alternative Segment 10 (Line 2)	1,114	0
Segment 11 (Lines 1 & 2)	1,870	0
Harry Allen Substation Expansion	10	0

Construction
Impacts would be the same as those described under the Proposed Action in **Section 4.12.4.2**., and presented in specific resource sections including **Sections 4.3.2** (Geology), **4.9.2** (Range), **4.14.2** (Recreation), and **4.20.2** (Transportation).

Operations, Maintenance, and Abandonment
Impacts would be the same as those described under the Proposed Action in **Section 4.12.4.2**.

4.12.5.3 Direct and Indirect Effects on Land Use from Water Supply Facilities

Table 4.12-4 below compares the long-term ROW to the amount of private land that would be affected as a result of granting the ROWs for each water supply alternative.

TABLE 4.12-4. ALTERNATIVE LONG-TERM WATER SUPPLY FACILITY ROWS AND PRIVATE LAND USE ACREAGE

ELEMENT	LONG-TERM BLM ROW (ACRES)	PRIVATE, STATE, OR OTHER AGENCY LANDS AFFECTED (ACRES)
Lages Station Well Field and Pipeline	0	102
Lages Station Water Supply Line	51	2
Alternative Reduced Lages w/Coyote Valley Ranch	240	6
Alternative North Well Field	51	0
Alternative Middle Well Field	109	0
Alternative South Well Field	233	0

Construction

Impacts would be the same as those described under the Proposed Action in **Section 4.12.4.3** and in presented in specific resource sections including **Sections 4.3.2** (Geology), **4.9.2** (Range), **4.14.2** (Recreation), and **4.20.2** (Transportation), except for the different acreages shown in **Table 4.12-4**.

Operations, Maintenance, and Abandonment

No additional impacts beyond those already described under the Proposed Action in **Section 4.12.4.3** would be anticipated.

4.12.5.4 Direct and Indirect Effects on Land Use from Rail Facilities

As described for the Proposed Action, a ROW would be required for the Alternative Rail Line. The rail line may be constructed with or without the water pipeline within the ROW south of Lages Station. If the Alternative Rail Line and water line share the ROW, it would be approximately 1,543 acres in size with 45 acres of private land affected near Shafter and the Lages Station area. Without the water pipeline, the ROWs extent would be approximately 1,533 acres with 43 acres of private land affected.

Construction

With the exception of the different acreage involved, impacts for the Alternative Rail Line and rail leads (for either the Alternative Rail Line or NNRy) would be the same as those described under the Proposed Action in **Section 4.12.4.4**, and presented in specific resource sections including **Sections 4.3.2** (Geology), **4.9.2** (Range), **4.14.2** (Recreation), and **4.20.2** (Transportation).

Operations, Maintenance, and Abandonment

Impacts from operations, maintenance and abandonment would be the same as those described under the Proposed Action in **Section 4.12.4.4**.

4.12.5.5 Mitigation

Additional mitigation measures are not required.

4.12.5.6 Unavoidable Adverse Impacts on Land Use

Unavoidable adverse impacts on land use under the North Plant Site Alternative include the permanent disposal of 2,479-acre parcel from public to private ownership that would limit land use to the certain prior existing rights on the fenced site. Granting ROWs for various project elements would also change the land use of those parcels.

4.12.5.7 Irreversible and Irretrievable Commitments of Resources

The irreversible and irretrievable commitments of resources would be the same as those discussed under the Proposed Action (**Section 4.12.4.7**).

4.12.5.8 Relationship of Short-term Uses and Long-term Productivity

The relationship of short-term use and long-term productivity would be the same as that discussed under the Proposed Action (**Section 4.12.4.8**).

4.12.6 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. Existing land use plans, policies, ownership, authorizations, access, and practices would continue under the current scenario into the foreseeable future.

4.13 Special Designation Areas

4.13.1 Indicators and Methods

This section addresses impacts of the proposed project elements to SDAs from the perspective of people using these areas. Lands outside of BLM jurisdiction were identified and included in the analysis if they were within 50 km of the project area because recognized natural resources are present on these lands and potential impacts from the project could affect these SDAs. Included are lands administered by the National Park Service, US Forest Service, National Wildlife Refuge, and Nevada Department of Wildlife Conservation lands. Other Nevada state lands, such as state parks, were not included: these are covered under Recreation Resources.

The following indicators were used to determine potential impacts to SDAs:

- Number of acres of temporary and long-term disturbance in each SDA within the Direct Effects Area
- Potential changes in air quality or other air clarity evaluations that could occur within SDAs due to construction and operation activities
- Potential changes in ambient noise levels that could occur within SDAs due to construction and operation activities
- SDAs or portions of SDAs that would have elements of the South Plant Site or North Plant Site Alternative visible, and the relationship between these areas and their Visible Resource Management (VRM) classifications
- Qualitative analysis of the potential changes to the darkness of the night sky dome as viewed from SDAs due to construction and operation activities
- Potential changes in erosion or sedimentation rates within SDAs

The following methods were used to evaluate these criteria:

- GIS mapping was used to determine the acreage of project elements that would occur within SDA boundaries.
- Wind rose data in **Section 3.6** was reviewed to identify those SDAs that commonly would be down-wind of the plant sites and thus, more likely to be affected by air-born pollutants. Wind direction and intensity was measured at the South and North Plant Sites from September 2006 to February 2007, and at the Ely Yelland Air Field for a five year period. The three wind roses summarizing these data showed similar results in prevailing wind direction and speed. No wind data was collected for other locations within the project area. The relationship between prevailing wind and potential transport of air pollutants is discussed by EEC element.
- Air Quality impact analyses in **Section 4.6** were reviewed to evaluate possible changes to ambient air quality within SDAs due to construction and operation of the EEC. This includes the potential for increases to atmospheric haze and decreased air clarity, the potential for air-born pollutants to be carried over SDAs, and the potential for deposition of these pollutants within the SDAs. These are discussed by EEC element.
- Monitored noise receptor locations (**Section 3.16**) and their proximity to SDAs were used to qualitatively evaluate potential noise levels in SDAs by EEC element.

- Viewshed information was reviewed to determine in what SDAs EEC elements would be visible. Viewsheds from both the power plant's boiler and smoke stack are shown in **Figures 4.15-2** and **4.15-11**. The VRM classification of BLM lands within the project area are illustrated in **Figure 3.15-1**. The VRM classification map shows how the viewscape of each SDA is currently managed: should it be kept as pristine as possible (VRM Class I) or are views of occasional man-made objects acceptable (VRM Class II and III), or is an industrial backdrop acceptable (VRM Class IV).The relationship between viewscape, VRM classification, and SDAs is discussed by EEC element.
- Evaluation of potential light pollution from EEC elements was limited because there is no known baseline available for the quality of the night sky in Steptoe Valley to measure or model changes against. This criterion is thus not discussed in all EEC elements.
- USGS maps were reviewed to determine if SDAs within the direct effects area would be prone to erosion due to construction or operation of the EEC.

As noted in **Section 3.13**, only eight of the 74 SDAs identified within 50 miles of the EEC elements are within the direct effects area. However, several other SDAs could be indirectly affected by the project. These are evaluated by EEC element below.

4.13.2 Proposed Action: South Plant Site

4.13.2.1 Direct and Indirect Effects on SDAs from Plant Site

Construction

Construction activities associated with the South Plant Site, the associated worker village, and the Mt. Wheeler Transmission Line would create fugitive dust, emissions of Criteria Air Pollutants (CAPs) and Hazardous Air Pollutants (HAPs) (see **Section 4.6**, **Tables 4.6-1** and **4.6-3** for a complete list of CAPs and HAPs) from heavy equipment and employee vehicles, and loud noises during excavation activities that could be noticeable to people utilizing SDAs. If construction took place after dark, bright lights could be visible from SDAs. Construction would last approximately five years.

<u>Land Area of EEC within SDAs</u>

No SDAs would be located within the South Plant Site, the associated worker village, or the Mt. Wheeler Transmission Line ROWs. However, 18 SDAs would be within 50 miles of the South Plant Site. These SDAs are listed in alphabetical order, with their direction from the South Plant Site, in **Table 4.13-1** below. Physical characteristics of these SDAs are briefly described in **Section 3.13**.

TABLE 4.13-1. SDAS LOCATED WITHIN 50 MILES OF THE SOUTH PLANT SITE

SDA NAME	DIRECTION FROM SOUTH PLANT SITE*	SDA NAME	DIRECTION FROM SOUTH PLANT SITE
Bald Mountain WA**	SSW	Mount Grafton WA	S
Becky Peak WA	N	Mount Moriah RNA	ESE
Bristlecone WA	SW	Mount Moriah WA	ESE
Cleve Creek Baldy RNA**	SE	North-South Schells RNA	SE
Currant Mountain WA	SSW	PET^	N
High Schells WA	E	Red Mountain WA	SSW
Goshute Canyon WA	N	Shellback WA	WSW
Government Peaks WA	E	South Egan WA	S

SDA NAME	DIRECTION FROM SOUTH PLANT SITE*	SDA NAME	DIRECTION FROM SOUTH PLANT SITE
Great Basin National Park	SE	Steptoe WMA**	S
Highland Ridge WA	SE	White Pine Range WA	WSW

*Directions include N (north), NNE (north-northeast), ENE (east-northeast), E (east), ESE (east-southeast), etc,
** WA = Wilderness Area, RNA = Research Natural Area, WMA = Wildlife Management Area (State of Nevada)
^ PET = Pony Express National Historic Trail

Wind Direction

As shown in the wind roses in **Figures 3.6-1** and **3.6-2**, prevailing winds in Steptoe Valley near the North and South Plant Sites are from the south to southwest, with less frequent winds coming from the north. Winds blow infrequently from westerly directions, and rarely from the east.

Those SDAs within the analysis area that are north to northeast of the South Plant Site are downwind approximately 50 percent of the time. These are the Becky Peak and Goshute Canyon WAs and the Pony Express National Historic Trail.

Those SDAs within the analysis area that would be south to south-southwest of the South Plant Site would be down-wind approximately 20 percent of the time. These are the Bald Mountain, Red Mountain, Currant Mountain, Mount Grafton, and South Egan WAs and the Steptoe WMA.

Those SDAs within the analysis area that would be south-southeast to east-northeast of the plant would be down-wind approximately 17 percent of the time. These are the High Schells WA, and the North-South Schells and Cleve Creek Baldy RNAs. Further away, but in the same direction, are the Government Peak, Mount Moriah, and Highland Ridge WAs; the Mount Moriah RNA, and GBNP.

Winds rarely come from easterly directions. The Shellback and White Pine Range WAs, located west-southwest of the plant site, would receive little air quality impacts from construction or operation activities. However, preliminary air quality dispersion modeling shows that the Bristlecone WA, located 6 miles west of the proposed South Plant Site and on the edge of Steptoe Valley, would be within the moderate impact area for air pollutants (See **Figure 4.6-2**).

The potential effects of air-born pollutants on these SDAs are discussed further below.

Air Quality

Air emission estimates have been calculated for the construction activities (**Section 4.6**) and impacts were estimated to be negligible to minor and short term in duration. Although no modeling or evaluation of the dispersion of particulates or emissions released during construction activities in terms of magnitude, quality, or distance have been conducted, it is estimated that impacts would not occur to any SDAs near the South Plant Site from emissions or dispersion of particulates from construction activities.

Noise

As described in **Section 4.16**, noise from construction activities at the South Plant Site is expected to be at a maximum of 25 dBA with traditional construction equipment and 36 dBA during intermittent periods when louder equipment would be in use. At 5.5 miles (the distance to the nearest ranch residence) these decibel levels would be at an estimated maximum of 11 dBA with traditional construction equipment, 17 dBA during intermittent periods (quieter than the inside of a typical residence – see **Table 4.13-2** below), and up to 52 dBA (roughly equivalent to

a normal conversation at 6 feet, or the average office background noise) during "steam blows" conducted at the final phases of construction.

TABLE 4.13-2. TYPICAL DECIBEL (DBA) LEVEL OF COMMON NOISES*

NOISE SOURCE	NOISE LEVEL	SUBJECTIVE DESCRIPTION
Commercial Jet Take-Off	120 dBA	Deafening
Busy Urban Street	90 dBA	Very loud
Normal Conversation at 6 feet	60 dBA	Moderate
Noise Mitigation Level for Undisturbed Lands (FHA)	57 dBA	Moderate
Typical Office (interior)	50 dBA	Moderate
Typical Residential (interior)	30 dBA	Faint

* Adapted from **Table 3.16-1**

The closest SDAs to the proposed South Plant Site – the Bristlecone and High Schells WAs and the North-South Schells and Cleve Creek Baldy RNAs – would be approximately 6 miles from the plant – just over the 5.5 mile distance referenced above. Thus, these SDAs may experience maximum noise levels close to those experienced at the closest ranch (52 dBA). In general, impacts would decrease as distance between the noise source and the SDA increases. The rate of change would vary with wind direction, speed, temperature, elevation, and other environmental factors. Due to the variability of noise travel, expected noise levels are not known; however, based upon the loudest construction impacts described above, impacts to SDAs near the South Plant Site would likely be negligible to minor in intensity and short term in duration.

Visitors to other SDAs within 50 miles of the South Plant Site would be unlikely to perceive any noise impacts from construction activities due to their distance and physiographic separation from the plant site.

<u>Viewsheds</u>

Construction of the smokestack, boiler, and nearby features at the South Plant Site could potentially be visible from the west sides of the High Schells WA and the North-South Schells and Cleve Creek Baldy RNAs, most of the Bristlecone WA (VRM Class I), and southeast-facing portions of the Goshute Canyon WA (VRM Class I). In addition, a small area on the north end of the Mount Grafton WA (VRM Class I) would be within the same viewscape once the tallest structures were erected. For the areas that are in VRM Classes II, III, and IV, these effects would be short-term and negligible to moderate, depending on the distance between the South Plant Site, and the viewer's level of concern about seeing man-made features. For the three SDAs with VRM Class I, these effects would be short-term and moderate.

<u>Light Pollution</u>

No known baseline is available to measure changes to the quality of the night sky in Steptoe Valley. However, current plans do not allow construction activities between 10 PM and 6 AM. Some lights would be used at night for theft protection and safety. The brightness of these lights is unknown; therefore, a level of impact has not been determined, although impacts to SDAs near the South Plant Site would likely be negligible.

<u>Erosion and Sedimentation</u>

The proposed South Plant Site would not be within or immediately adjacent to any SDA, thus erosion and sedimentation within SDAs are not an issue.

Operations, Maintenance, and Abandonment

Daily operation of the coal plant would create smoke stack emissions, steam, emissions from railroad trains and trucks working at or stopping at the plant, fugitive dust from exposed dirt at staging and work areas, fugitive dust from coal stockpiles, and noise from trucks and trains entering and leaving the facility. Visual effects would include the presence of lights at night that surround the plant and those located on the smoke stacks, hoppers, and other plant facilities, as well as visual effects of power lines and switching stations extending outward from the plant (see **Section 4.15**).

Maintenance of the coal plant could include release of increased amounts of particulate matter, emissions, or steam during cleaning operations, noise associated with maintenance activities, or demolition activities, and the sound and emissions from vehicles coming and going from the plant.

Abandonment would not occur if the plant could be used for other purposes. If it were dismantled the demolition would cause fugitive dust and finer particle emissions, noises from demolition activities, trucks and trains, and visual effects from lights and demolition activities that would be similar to construction activities.

<u>Land area of EEC within SDAs and Wind Direction</u>

This is discussed under Construction, above.

<u>Air Quality</u>

Section 4.6 discusses air quality impacts due to the construction and operation of the power plant. Two Class I airsheds (highest quality) were identified by the Federal Land Managers (FLMs) within the analysis area. These are Zion National Park, located approximately 160 miles southeast of the South Plant Site and the Jarbidge WA, located approximately 150 miles north of the South Plant Site. Two sensitive Class II air sheds were also identified for inclusion in the impact analysis by the FLMs. These are Great Basin National Park (GBNP), located approximately 35 miles southeast of the South Plant Site and Ruby Lake National Wildlife Refuge (Ruby Lake NWR); located approximately 55 miles northwest of the South Plant Site.

As explained in more detail in **Section 4.6**, the modeled loss of air clarity at Zion National Park was within acceptable limits set by the Federal Land Managers' Air Group (FLAG) "Tier I" and "Tier 2" thresholds. However, these thresholds were exceeded at the Jarbidge WA. **Table 4.6-7** in **Section 4.6** models the maximum visibility degradation due to coal plant operation to be a 2.7 percent increase in light scattering, or visibility loss, over a three-year study at Zion National Park, and a visibility loss as high as 7.4 percent for the Jarbidge WA.

The same modeling of pollutants was applied to the two Class II areas. Great Basin National Park is between the South Plant Site and Zion National Park, while Ruby Lake NWR is about 15 degrees south of the trajectory from the South Plant Site to the Jarbidge WA. Modeling showed pollutants would be at higher concentrations in these Class II areas than the Class I areas, and exceeded Class I thresholds at both locations. This indicates that pollution levels increase as distance from the plant decreases. However, FLAG guidance does not identify impact thresholds for Class II areas.

It is probable that those SDAs located roughly in line with, and between, the South Plant Site and these four areas would receive similar, and likely higher, levels of air pollutants due to their closer proximity to the power plant site.

Goshute Canyon WA is the only SDA that lies directly between the South Plant Site and Jarbidge WA. The Becky Peak WA is slightly east of this direct line. Since these WAs are approximately half the distance from the South Plant Site as the Jarbidge WA, impacts to these SDAs would likely be larger than those experienced at the Jarbidge WA.

The High Schells WA, and the North-South Schells and Cleve Creek Baldy RNAs are between the South Plant Site and the Class II airshed at GBNP and thus, are likely to be exposed to more pollutants than the park. Mt. Moriah and Highland Ridge WAs, and the adjoining Mt. Moriah RNA are slightly north of GBNP and thus, likely are subject to similar levels of pollutants as this park.

Government Peak WA is about 25 miles northeast of GBNP, thus inferences about air quality impacts in relation to this Class II airshed are difficult to assess. Wind direction data indicate that this SDA would be downwind about 10 percent of the time, thus air quality impacts should be negligible to minor and short-term during construction activities.

Effects on the Shellback, Bald Mountain, South Egan Range, Currant Mountain, Mount Grafton, White Pine Range, and Red Mountain WAs could not be effectively evaluated because there are no air quality monitoring stations near these SDAs, nor are they in line with any of the four Class I or Class II air sheds noted above. Wind data suggest they would be downwind of the South Plant Site an estimated 10 to 20 percent or more of the time, thus it could be presumed that impacts during operation activities could range from negligible to minor and long-term.

The dispersion of PM_{10}, NO_2, and SO_2, was modeled for operations at both the North and South Plant Sites, the results of which are shown in **Figures 4.6-2** and **4.6-4**. The moderate impact area for PM_{10} was determined to extend approximately 7 miles from the South Plant Site; for NO_2 it was estimated to extend approximately 11 miles from the plant site; and for SO_2 it was estimated to extend approximately 28 miles. It is probable that those SDAs located within these 7, 11, and 28-mile radii would fall within the moderate impact area.

Impacts to SDAs from operation of the South Plant Site would be long-term, and could range from negligible in SDAs located farthest from the South Plant Site to moderate in those SDAs located nearer to the plant and within the moderate impact areas shown in **Figures 4.6-2** and **4.6-4**.

<u>Noise</u>

Noise during plant operations would be similar to that discussed under Construction, above, but would typically be somewhat higher, as noise impacts from power plant operations at the Steptoe Ranch, located 5.5 miles away, were predicted to approach 28 dBA, vs. 11 to 17 dBA estimated during construction. This noise level is slightly less than the noise inside a typical residence. **Section 4.16** shows that these noise levels would be long-term and minor to moderate in magnitude at Steptoe Ranch, and that minor to moderate noise impacts would likely be noted through Steptoe Valley due to increased population and future economic activity. Thus, SDAs located closest to the plant would likely see similar impact levels and SDAs located farther away would experience reduced impacts from operational noise levels.

<u>Viewsheds</u>

These impacts would be the same as those listed under Construction, above, except they would be long-term in duration.

Light Pollution

No known baseline is available to measure changes to the quality of the night sky in Steptoe Valley. The operating power plant would be lighted at night for protection and safety. Although the brightness of these lights is unknown, the level of impact is not expected to exceed negligible to minor levels to SDAs near the South Plant Site.

Erosion

The South Plant Site would not be within or immediately adjacent to any SDAs, thus erosion and sedimentation of SDAs related to power plant operation are not an issue.

4.13.2.2 Direct and Indirect Effects on Special Designations from Electric Transmission Facilities

Eight SDAs occur within or are located immediately adjacent to the electric transmission facilities running from the South Plant Site to the Harry Allen Substation. There are numerous additional SDAs within 50 miles of the various segments of the electric transmission facilities of the EEC as listed and briefly described in **Section 3.13**, **Table 3.13-2.**

Construction

Construction of electric transmission facilities would create fugitive dust, emissions from heavy equipment and employee vehicles, areas of light if work continued after dark, and loud noises during excavation activities that could be noticeable to people utilizing SDAs. Construction would last 18-24 months, with construction crews moving through an area at the rate of one to several miles per week.

Land Area of EEC in SDAs

The electric transmission facilities for the South Plant Site and the associated Action Alternatives would pass through four SDAs: the PET, Kane Springs ACEC, Arrow Canyon ACEC, and Coyote Springs ACEC. These facilities would pass adjacent to four additional SDAs: the Kirch WMA, Delamar Mountains WA, Pahranagat NWR, and Desert Range NWR. Approximately 75 miles of the electric transmission facilities pass through these SDAs.

All SDAs listed in **Section 3.13** are within the analysis area for the electric transmission facilities except for the Ruby Mountains and East Humboldt WAs; the Seitz Canyon/Echo Lake, Hole-in-the-Mountain, and Pearl Peak RNAs; the Ruby Lake NWR; and Franklin WMA.

Those SDAs that would be intersected by, or are within the same watershed basin boundary as the electric transmission facilities, would be most likely to be affected by visual, sound, or other impacts from construction and operation activities. These are listed in **Table 4.13-3** below.

TABLE 4.13-3. SDAS THAT ARE LOCATED WITHIN THE SAME WATERSHED BASIN AS THE ELECTRIC TRANSMISSION FACILITIES FOR THE PROPOSED ACTION AND SOUTH PLANT SITE ALTERNATIVES

SDA	SDA	SDA
Arrow Canyon ACEC	Far South Egans WA	PET
Arrow Canyon WA	Goshute Canyon WA	Red Mountain WA
Bald Mountain WA	Goshute Cave Geologic Area	Riordan's Well WSA
Becky Peak WA	Grant Range WWA	Shellback WA
Big Rocks WA	High Schells WA	South Egan Range WA
Blue Eagle WSA	Kane Springs ACEC	South Pahroc WA
Bristlecone WA	Kirsch WMA	Steptoe Valley WMA

SDA	SDA	SDA
Cleve Creek Baldy RNA	Meadow Valley Range WA	Troy Peak RNA
Coyote Springs ACEC	Mormon Mesa ACEC	Weepah Spring WA
Currant Mountain RNA	North-South Schells RNA	White Pine Range WA
Delamar Mountains WA	Pahranagat NWR	White Pine Peak RNA
Desert Range NWR		

Visitors to those SDAs that have at least one mountain range or ridge between them and the electric transmission facilities would be less likely to see, hear, or be otherwise aware of these facilities. These SDAs are listed in alphabetical order in **Table 4.13-4** below.

TABLE 4.13-4. SDAS WITH AT LEAST ONE MOUNTAIN RANGE BETWEEN THEM AND THE ELECTRIC TRANSMISSION FACILITIES FOR THE PROPOSED ACTION AND SOUTH PLANT SITE ALTERNATIVES

SDA	SDA	SDA
Bluebell WSA	Moapa Valley NWR	Railroad Valley WMA
Beaver Dam Slope ACEC	Mormon Mountains WA	Red Rock/Devil's Throat WA
Clover Mts. WA	Mount Grafton WA	Ruby Lake NWR
Fortification Range WA	Mount Irish WA	South Pequop WSA
Franklin WMA	Mount Moriah RNA	The Wall WSA
Gold Butte ACEC, Parts A&B	Mount Moriah WA	Tunnel Spring WA
Goshute Peak WSA	Muddy Mountains WA	Virgin River ACEC
Government Peak WA	Palisade Mesa WSA	Virgin Mountains WA
Great Basin National Park	Park Range WSA	White Rock WA
Hidden Valley ACEC	Parsnip Peak WA	Worthington Mts. WA
Highland Ridge WA	Pearl Peak RNA	
Lime Canyon WA	Quinn Canyon WA	

Of the SDAs listed in **Table 4.13-4** above, eight are located south of I-15 or are separated from the actual facilities by other, more noticeable man-made features such as buildings and freeways. These are the Gold Butte ACECs – Parts A and B (including Gold Butte Townsite), Hidden Valley ACEC, Lime Canyon WA, Red Rock Springs/Devil's Throat ACECs, Muddy Mountains WA, Virgin River ACEC, and the Virgin Mountains ACEC. These are not discussed further in this section.

<u>Wind Direction</u>

No wind data is available for the electric transmission facilities located beyond the South and North Plant Sites, therefore this criterion is not discussed further.

<u>Air Quality</u>

The estimated volume of fugitive dust created during the 24-month construction period of the electric transmission facilities is 1,615 tons. This assumes watering of the earthmoving areas for dust control. **Section 4.6** describes these effects as temporary and minor in areas directly adjacent to the work area, which includes those SDAs that are within or immediately adjacent to the electric transmission facilities.

Although there is no prevailing wind data for areas outside Steptoe Valley, winds are likely overall from the northwest to southwest. Visitors to those SDAs that are located in easterly directions from electric transmission facilities construction activities are more likely to experience noticeable changes in air quality from construction activities than visitors to SDAs located in westerly directions. Impacts would become negligible as distance from the activity increased.

Noise

Construction activities would create noise levels similar to those associated with the South Plant Site, with the exception of noise related to "steam blows" conducted at the final phases of construction. As discussed above, noises would range from a maximum of 25 dBA with traditional construction equipment to 36 dBA during intermittent periods when louder equipment is in use. At 5.5 miles distance these decibel levels would be at an estimated 11 dBA to 17 dBA. This is quieter than inside of a typical residence. Those SDAs that are neither adjacent to, nor within, the electric transmission facilities would experience similar to lower noise levels as they are as far from, or farther from, the electric transmission facilities. Impacts of these noise levels, which would be transient in nature as construction crews move through an area, would be negligible to minor and short term.

Those SDAs that are adjacent to, or within, the direct effects area would be subject to much louder noises. **Table 4.16-1** shows the mean and maximum decibel levels of loud equipment that is 50 feet away. The loudest noise would come from a helicopter (mean = 102 dBA, maximum = 105 dBA), which could be used only occasionally. A ground scraper, which would be much more commonly used, is typically 90 dBA (maximum = 94 dBA). This is roughly equivalent to a busy urban street. Impacts of these noises, which would be transient in nature as construction crews move through an area, would be minor to moderate and short-term. The effect of these noises to SDAs would dissipate as distance from construction activities increased.

Visitors to those SDAs that are at least one mountain range away from activities, or south of I-15, would likely not be able to hear or discern noises related to the construction activities for the electric transmission facilities.

Viewsheds

The boundaries of all SDAs that are within or immediately adjacent to the electric transmission facilities are within 8 miles of at least one of the following: existing paved roads, railroad tracks, operating or historic mines, or existing power lines. Small portions of Segments 9C and 9D, within the SWIP Corridor, occur within the Delamar Wilderness Area. Those SDAs that are within the direct effects area include the PET, a VRM Class II area. The SDAs on BLM administered lands are within Class I areas, the remaining SDAs within the direct effects area are within VRM Class III areas. Being able to see the construction activities of a narrow, linear human feature such as a power line would be a relatively insignificant addition of human activity to the viewscape and would fit within the management standards of this VRM classification. A total of 75 miles of EEC transmission facilities pass through these SDAs. Construction of the electric transmission facilities would cause short-term and negligible to minor impacts to SDAs.

Visitors to those SDAs that are at least one mountain range away from activities, or south of I-15, would likely not interpret construction activities related to the electric transmission facilities as a major distraction from the surrounding viewscape.

Light Pollution

Impacts from construction lighting after dark would be noticeable from some SDAs if there was a direct line of site from the SDA to the work area. These effects would be more noticeable to users desiring a remote, wilderness experience and in areas with few other visible lights. However, these effects would still be negligible to minor and short-term in duration as they would not be a major distraction from the surrounding viewscape and would not have a measurable effect on the darkness of the night sky.

Erosion and Sedimentation

Construction of electric transmission facilities that pass through SDAs could create sediment that could enter ephemeral washes and/or affect the aesthetics of SDAs in the direct effects area. Three SDAs could potentially be affected by erosion and sedimentation. These are the Mormon Mesa, Kane Springs, and Coyote Springs ACECs. These effects are discussed in more detail in **Section 4.1 (Water)**. Sedimentation would be minimized and/or avoided through the use of BMPs (**Appendix 2A**), such as silt fencing and straw bale check dams. The effects of potential sedimentation would be negligible to minor and short-term in duration.

Operations, Maintenance, and Abandonment

The operation of the electric transmission facilities would have negligible impacts on SDAs because once construction was completed, exposed construction areas would be reclaimed to a vegetative cover, minimizing fugitive dust, erosion, and air quality issues. Only infrequent activity and/or noise related to inspection and maintenance work would occur.

As discussed in Construction above, changes to the viewscape would be negligible. The power line and substations would be visible from only a few locations in the SDAs located within the direct impacts area, as well as a few others located in close proximity to the facilities. No lights would be present on the electric transmission towers or lines. It is likely that a few small lights would be used for safety at the Robinson Summit Substation and the existing Harry Allen Substation. The existing Harry Allen Substation is visible from existing highways that see traffic throughout the night and the Robinson Summit Substation is blocked from view from US-50.

Thus, operations and maintenance of the electric transmission facilities would cause negligible effects on SDAs. Since activities would occur intermittently throughout the life of the project and the facilities, once constructed, are anticipated to remain for a long time, impacts would be long-term in duration.

Abandonment would require dismantling of the transmission line and likely replacement with another line. Impacts would be the same as those described under Construction, above.

4.13.2.3 Direct and Indirect Effects on Special Designations from Water Supply Facilities

Construction

There are 29 SDAs located within 50 miles of the Proposed Action water supply facilities and many of them also are within 50 miles of the South Plant Site. The Water Supply Alternatives to the Proposed Action include the same SDAs. These SDAs are listed and briefly described in **Table 3.13-3**. These SDAs are listed according to their relationship with prevailing winds in **Table 4.13-5** below.

TABLE 4.13-5. SDAS AND THEIR LOCATION RELATIVE TO THE PROPOSED ACTION WATER SUPPLY FACILITIES

WITHIN DIRECT EFFECTS AREA	NORTHWEST TO NORTHEAST OF FACILITIES (Prevailing wind blows toward these areas)	SOUTH, SOUTHEAST, OR SOUTHWEST OF FACILITIES	GENERALLY EAST OF FACILITIES	GENERALLY WEST OF FACILITIES (Wind very seldom blows toward these areas)
PET	Becky Peak WA	Bald Mountain WA	Cleve Creek Baldy RNA	Bristlecone WA*
	East Humboldt WA	Currant Mountain WA	Government Peak WA	White Pine Peak RNA
	Franklin WMA	Mount Grafton WA	Great Basin National Park	
	Goshute Canyon WA	Red Mountain WA	High Schells WA	
	Goshute Cave Geologic Area	Shellback WA	Mount Moriah WA	
	Goshute Peak WA	South Egan Range WA	Mount Moriah RNA	
	Hole-in-the-Mountain RNA	Steptoe Valley WMA	North-South Schells RNA	
	Pearl Peak RNA			
	Ruby Lake NWR			
	Ruby Mountains WA			
	Seitz Canyon/Echo Lake RNA			
	South Pequop W			

* Though this SDA is located east of the facility, its close proximity to the facility makes it subject to more air pollution.

Land Area of EEC within SDAs

The PET is the only SDA that would be within the direct effects area of the water supply facilities. The 200-foot-wide water supply construction ROW would result in less than 1 acre of disturbance to this SDA. This would be a negligible and short-term effect.

If the Middle Well Field Alternative were developed as part of the South Plant Site, well sites would be located on both sides of the PET. While actual well locations could be adjusted to avoid the actual PET ROW, visitors to the PET would likely be aware that they were in the middle of a well field construction project. This would be a minor to moderate impact of short-term duration.

Wind Direction

Winds are described under South Plant Site, Construction, above. The SDAs located within 50 miles of the water supply facilities are shown in **Table 4.13-5** above. They are grouped by their direction from the water supply facilities and illustrate which SDAs are within the direct effects area, which are downwind the majority of the time, and which would be downwind only occasionally.

Air Quality

Total PM_{10} emissions produced during construction of the water supply facilities are estimated to be 116 tons (See **Section 4.6.2.3**). This would be a temporary, minor impact to areas around

the construction zone. Extrapolating information from models of air pollutant dispersion from construction of the power plants themselves (see **Figures 4.6-1, 4.6-2, 4.6-3,** and **4.6-4**), and noting that total PM_{10} volumes are approximately 5 percent of that modeled to be released during power plant construction, the range of dispersion of pollutants would be much smaller than expected for plant construction. Using these assumptions, only the PET, which would be within the direct effect area, would see a measurable, pollution increase from water supply facilities construction activities. Impacts of water supply facility construction to the PET would be temporary and minor to moderate. Impacts to all other SDAs would be transient and negligible.

Noise

Construction of water wells and water lines would create noise from drilling and trenching equipment, dust from the minor amount of excavation required, and minor visual impacts over relatively short distances. Well drilling would last approximately 24 months at any one of the five well field locations being considered. Pipeline construction would move over land at a rate of about 1 mile every two weeks to two months. Once well and pipeline installation was complete, restoration would occur.

Drilling of wells and construction of pipelines would include use of heavy equipment such as rotary drilling rigs, earth scrapers, and bulldozers. Construction noises as high as 75 dBA could be expected within 200 feet of pipeline activities, and approximately 0.6 miles away maximum noise levels are expected to drop to 50 dBA.

Expected noise levels would vary with wind direction, season, temperature, and location within an SDA. Those SDAs located in typical up-wind directions of the water supply facilities would likely experience fewer days of noticeable noise level increases than those located in typical down-wind directions (see South Plant Site for discussion of prevailing winds).

For the Proposed Action, the PET would be the only SDA within the direct effect area. Visitors within the immediate construction activity area within the PET would experience high noise levels as pipe laying moved through this ROW. These effects would last a few weeks, and would be transitory and would range from negligible to moderate back to negligible as pipe laying moved closer to, over, and then away from the PET. The next closest SDAs to the water supply facilities in the prevailing down-wind directions are the Becky Peak and High Schells WAs, and the North-South Schells RNA (approximately 2, 3, and 4 miles away, respectively). Noise levels would likely be negligible to minor, and short-term in duration.

The Bristlecone WA is within 6 miles of the water supply facilities, but is up-wind and would be less likely to experience measurable noise increases related to pipeline construction. Noise levels would likely be negligible and short-term in duration.

If the Middle Well Field alternative were selected, the PET would be within the direct effects area and would likely experience occasional periods of increased noise during the entire period of well field development. This likely would be a moderate and short-term impact to users of the PET within the immediate area.

The Lages Station and North Well Fields are closest to the Becky Peak and Goshute Canyon WAs. The Coyote Valley Ranch and South Well Fields are closest to the North-South Shells and Bristlecone WAs, and the North-South Schells and Cleve Creek Baldy RNAs. As with the Middle Well Field alternatives, these SDAs would likely experience periods of occasional increased noise during well development. The expected decibel level in each of these areas is unknown. Effects likely would range from negligible to moderate, and would be short-term during construction activities.

Viewsheds

The water supply facilities are within 1 to 2 miles of existing asphalt roads, railroad tracks, and other human developments. The SDAs that could have views of water supply facility construction activities from parts of the SDAs would be the Becky Peak and Goshute Canyon WAs, Bristlecone and High Schells WAs and the PET (all VRM Class I except the High Schells WA, which is not classified). Construction activities from the water supply facilities would be short-term and negligible for the Proposed Action and all South Plant Site water supply facilities alternatives.

Light Pollution

Impacts from lighting, if construction work took place after dark, would be noticeable if there was a direct line of site from the SDA to the work area. Since all areas of the water supply facilities are close to existing paved highways, impacts would be negligible in intensity and short-term in duration for the Proposed Action and all Action Alternatives.

Erosion and Sedimentation

The PET would be the only SDA within the direct effect area and the only one that would be exposed to erosion and sedimentation due to construction activities. The PET is currently a two-track county road that sees annual grading and use by vehicles. The pipeline crossing would be located on a shallow grade (less than 5 degree slope). The use of BMPs such as silt fence and straw bale check dams would effectively control erosion. Impacts would be temporary and negligible.

Operations, Maintenance, and Abandonment

Operations and maintenance impacts would be essentially the same as those described under electric transmission facilities, Operations, above and would be negligible in intensity but long-term in duration.

Abandonment of water supply facilities would be somewhat different than described under electric transmission facilities. Pipes would be left in the ground and water wells would be capped and sealed, or plugged. This would generate minimal dust and emissions. Due to the small scale, impacts would be negligible and transitory in nature.

4.13.2.4 Direct and Indirect Effects on Special Designations from Rail Facilities

There are 28 SDAs that would be within 50 miles of the South Plant Site Rail Lead and Alternative Rail Line facilities. Many of these SDAs would also be within 50 miles of the South Plant Site and water supply facilities discussed previously. These SDAs are listed alphabetically in **Table 4.13-6** below, and briefly described in **Table 3.13-1**.

TABLE 4.13-6. SDAS LOCATED WITHIN 50 MILES OF THE SOUTH PLANT SITE RAIL LEAD OR ALTERNATIVE RAIL LINE FOR THE SOUTH PLANT SITE

SDA	SDA	SDA
Bald Mountain WA	Great Basin National Park	Ruby Mountains WA
Becky Peak WA	High Schells WA	Ruby Lake NWR
Bluebell WSA	Hole-in-the-Mountain RNA	Seitz Canyon/Echo Lake RNA
Bristlecone WA	Ruby Mountains WA	Shellback WA
Cleve Creek Baldy RNA	Mount Grafton WA	South Egan Range WA

SDA	SDA	SDA
East Humboldt WA	Mount Moriah RNA	South Pequop WA
Franklin WMA	Mount Moriah WA	Steptoe Valley
Goshute Canyon WA	North-South Schells RNA	White Pine Range WA
Goshute Peak WA	Pearl Peak RNA	
Government Peak WA	PET	

Construction

As with construction activities described above for other project elements, these activities would create fugitive dust, emissions from heavy equipment and employee vehicles, and loud noises during excavation activities that could be noticeable to people utilizing nearby SDAs. If construction took place after dark, bright lights would be visible from those SDAs that have visual connection with the project area for the Rail Facilities.

Land Area of the EEC in SDAs

No SDAs are within the direct effect area of the South Plant Site Rail Lead.

The only SDA within the direct effects area of the Alternative Rail Line would be the PET. The 300-foot railroad construction ROW would cause approximately 1.5 acres of disturbance to this SDA. Effects from construction activities would be short-term and minor.

Wind Direction

No wind data are available for the north end of the Alternative Rail Line project area. Assuming that data for the North and South Plant Sites is applicable, prevailing winds are typically from the south to southwest, with less frequent winds coming from the north. Winds blow infrequently from westerly directions, and very rarely from the east.

The SDAs most likely to be affected by changes in air quality due to rail facilities construction activities would be the Bristlecone and High Schells WAs and the North-South Schells RNA. Effects are discussed under Air Quality, below.

The SDAs most likely to be affected by changes in air quality due the construction of the proposed Alternate Rail Line would be the Bluebell, Goshute Peak, and South Pequop WSAs, Becky Peak, Goshute Canyon, and High Schells WAs. Effects are discussed under Air Quality, below.

Air Quality

The estimated volume of fugitive dust created during a 24-month construction period for the rail lead or Alternative Rail Line is 320 tons. This was determined to be a temporary, minor impact to adjacent areas in **Section 4.6**. Extrapolating information from models of air pollutant dispersion from construction of the power plants themselves (See **Figures 4.6-1, 4.6-2, 4.6-3,** and **4.6-4**), and noting that total PM_{10} volumes are approximately 10 percent of that modeled to be released during power plant construction, the range of dispersion of pollutants would be much smaller than expected for plant construction. Using these assumptions, it is likely that only the PET, which would be within the direct impact area, would see a measurable pollution increase from railroad construction. Impacts of railroad construction to the PET would be temporary and moderate. Impacts to all other SDAs would be transient and negligible.

Noise

The noise level at the boundaries of the railroad right-of-way would be approximately 88 dBA for the average of six construction train passages per day. Heavy equipment would generate noise levels between 90 dBA and 95 dBA within 50 feet of the ROW. This is equivalent to a busy urban street and is considered “very loud”. The PET would be the only SDA within the direct effects area that would be subject to these noise levels as construction approached, crossed, and receded from this SDA. During construction, these impacts would be moderate to major but short-term in duration.

Maximum noise levels associated with construction of the rail lead or Alternative Rail Line on other SDAs would be comparable to the noise levels from construction of the nearby power plant, which were around 30 dBA at 5.5 miles distance.

The Becky Peak, Bristlecone, and High Schells WAs, and the North-South Schells RNA are all within 6 miles of the rail lead.

The South Pequop, Bluebell, and Goshute Peak WSAs, Goshute Canyon, Becky Peak, Bristlecone, and High Shells WAs, and the North-South Schells RNA are all within 6 miles of the proposed Alternate Rail Line. These areas would likely be subject to similar noise levels.

These noises would dissipate as distance from construction activities increased, and would be affected by vegetation and geography. These impacts likely would be negligible to moderate in magnitude, and temporary in duration. All other SDAs are significantly further away and/or are located over a mountain range and so visitors would be unlikely to hear or recognize noise from the rail facilities construction activities.

Viewshed

The boundaries of all SDAs within a 50-mile radius of the rail lead or Alternative Rail Line are within 8 miles of existing paved roads, other railroad tracks, operating or historic mines, or existing power lines. All but one of these SDAs are within VRM Class III, with some areas next to roads being VRM Class II. Goshute Canyon is a VRM Class I area (See **Figure 3.15-1**). Being able to see the construction of either the rail lead or the Alternative Rail Line would be a relatively insignificant addition of human activity to a viewscape that already includes a main highway and existing rail line (the NNRy). In addition, this man-made element likely would be only intermittently visible to a visitor of an SDA due to natural land features and vegetation. Construction would cause a short-term and negligible impact to all the SDAs.

Light Pollution

Impacts from lighting, if construction work took place after dark, would be noticeable if there was a direct line of site from the SDA to the work area. The narrow, linear nature of the railroad ROW and its proximity to paved roads would make these impacts negligible in intensity and short-term in duration.

Erosion and Sedimentation

The PET would be the only SDA within the direct effects area of the Alternative Rail Line, and the only one that would be exposed to erosion and sedimentation due to construction activities. It is currently an annually, graded two-track county road that sees use by vehicles. The railroad crossing would be on a low grade (less than 5 degree slope). The use of BMPs such as silt fence and straw bale check dams would effectively control erosion and sedimentation. Impacts would be temporary and negligible.

Operations, Maintenance, and Abandonment

The project would result in an average of two to four trains per day running from Shafter to the plant site.

Land Area of the EEC in SDAs

The only SDA within the direct effects area would be the PET. The 200-foot wide permanent railroad ROW would cause approximately 1.5 acres of disturbance to this SDA, additional disturbance from operation, maintenance, and abandonment activities are not anticipated.

Wind Direction and Air Quality

Wind direction data are discussed under the South Plant Site, Construction, above. The annual air pollutant emissions from the diesel train engines using this route were estimated to be insignificant compared to existing outputs in the area (See **Section 4.6.2.4**). Air quality impacts from locomotive exhaust are estimated to extend up to a few hundred feet from the train tracks as each train passes. The only SDA within this distance range is the PET. These impacts would be long-term and negligible to minor. It is unlikely that train operation would cause measurable air quality impacts in remaining SDAs.

Noise

These changes would be similar to those described under Construction, above, except that the noise of construction activities would be replaced with the occasional sound of trains passing. Because there would be between two and four trains per day, effects would be minor to major at the PET crossing if visitors were actually at the crossing when a train was going by, and negligible at other SDAs. Effects would be long-term.

Viewshed

Changes would be the same as those described under Construction, above, except that effects would be long-term.

Light Pollution

There would be no lights on the railroad tracks except from trains. These impacts would be negligible, and though intermittent would be long-term in duration as they would last the life of the project.

Erosion and Sedimentation

Once railroad construction was complete, no impacts are anticipated at the PET. No other SDAs would be subject to erosion or sedimentation.

The railroad is not proposed for abandonment at the end of the EEC plant's life. If it were abandoned, effects would be similar to, but less invasive than, those described in Construction, above.

4.13.2.5 Mitigation

Additional mitigation measures are not required.

4.13.2.6 Unavoidable Adverse Impacts on Special Designation Areas

Unavoidable adverse impacts to SDAs would occur from any permanent and unreclaimed disturbance areas created during construction activities within SDAs. In addition, unavoidable impacts would also occur from operation of the plant and other project elements that might impact SDAs from the release of air-born pollutants from plant operation, fugitive dust from work

yards and coal stockpiles, noise from plant operations, visual pollution in the form of haze and lights on the power plant, and increased visual clutter within the viewscape due to the plant, railroad, and electric transmission lines.

4.13.2.7 Irreversible and Irretrievable Commitments of Resources

It is not anticipated that irreversible and irretrievable commitments of resources to SDAs would occur.

4.13.2.8 Relationship of Short-term Uses and Long-term Productivity

Most impacts on SDAs would result from relatively short-term construction activities, but others (such as visual or visibility impacts) would persist for the operational life of the plant. This is compared to the longer-term productivity of increasing the regional supply of electrical power in Nevada.

4.13.3 North Plant Site Alternative

4.13.3.1 Direct and Indirect Effects on Special Designations from Plant Site

Construction

Construction activities associated with the North Plant Site would be the same as those listed under the South Plant Site, above.

Land Area of EEC within SDAs

No SDAs are located within the North Plant Site. However, 16 SDAs would be within 50 miles of this element of the EEC. These SDAs are listed, based on their direction from the North Plant Site in **Table 4.13-7** below. Physical characteristics of these SDAs are briefly described in **Table 3.13-1**.

TABLE 4.13-7. SDAS LOCATED WITHIN 50 MILES OF THE NORTH PLANT SITE

SDA NAME	DIRECTION FROM THE NORTH PLANT SITE*	SDA NAME	DIRECTION FROM THE NORTH PLANT SITE
Becky Peak WA	E	Mount Moriah RNA	SSE
Bristlecone WA	SSW	Mount Moriah WA	SSE
Cleve Creek Baldy RNA	S	North-South Schells RNA	S
Franklin WMA	WNW	Pearl Peak RNA	WNW
Goshute Canyon WA	W	PET	S
Goshute Peak WSA	NNE	Ruby Lake NWR	WNW
Government Peaks WA	SSE	Ruby Mountain WA	NW
High Schells WA	S	South Pequop	N

*Directions include N (north), NNE (north-northeast), ENE (east-northeast), E (east), ESE (east-southeast), etc,

Wind Direction

Wind direction data are discussed under the South Plant Site, Construction, above, except for the following differences in SDAs.

The Goshute Peak and South Pequop WSAs would be north to northeast of the North Plant Site.

The SDAs within the project area that would be south to south-southwest of the North Plant Site are the PET, the Bristlecone and High Schells WAs, and the North-South Schells and Cleve Creek Baldy RNAs.

Those SDAs within the project area that are south-southeast are the Government Peaks and Mount Moriah WAs, and the Mount Moriah RNA. The Becky Peak WA would be east-northeast of the plant site.

Winds rarely come from easterly directions. However, preliminary air quality dispersion modeling shows that the Goshute Canyon WA, located approximately 5 miles west of the North Plant Site, would be within the moderate impact area for air pollutants (see **Figure 4.6-4**).

Based on modeling of air quality effects at Jarbidge WA and Great Basin National Park, several SDAs outside of the 50-mile project area could likely be affected. This would include the East Humboldt WA and the Hole-in-the-Mountain RNAs.

Air Quality

Air emission estimates have been calculated for the construction activities (**Section 4.6**) and impacts were estimated to be negligible to minor and short term in duration. Although no modeling or evaluation of the dispersion of particulates or emissions released during construction activities in terms of magnitude, quality, or distance have been conducted, it is estimated that impacts would not occur to any SDAs near the North Plant Site from emissions or dispersion of particulates from construction activities.

Noise

Noise from construction activities at the North Plant Site would be the same as that described for the South Plant Site (see **Section 4.13.2.1** above), except that some other SDAs would be affected.

The closest SDAs to the North Plant Site – the Becky Peak and Goshute Canyon WAs – would be approximately 5 and 6 miles from the plant, respectively. The effects would likely be similar to those listed under the Bristlecone and High Schells WAs, and would be affected by the same variables.

The next closest SDAs to the north would be the South Pequop and Goshute Peak WSAs. Because they are beyond a set of hills, they would likely be subject to very little noise from construction activities. The next SDAs to the south and southeast are the Bristlecone and High Schells WAs and the North-South Schells and Cleve Creek Baldy RNAs. At approximately 25 miles from the North Plant Site and behind a long ridge, they would likely be subject to very little sound from construction activities. Effects would be negligible and short-term in these areas.

Visitors to other SDAs within 50 miles of the North Plant Site would be unlikely to perceive any noise impacts from construction activities due to their distance and physiographic separation from the plant site.

Viewsheds

Visitors to the Becky Peak (VRM Class II), Goshute Canyon (VRM Class I), and Bristlecone (VRM Class IV) Wilderness Areas would be able to the see the smokestack of the North Plant Site once it was partially completed, as well as any dust clouds that reach similar elevations. These effects would be short-term and negligible to moderate, depending on the viewer's level of concern about seeing man-made features, and the VRM Classification management objectives.

Light Pollution

Effects would be the same as those listed under the South Plant Site, above, with the exception of the North Plant Site being located farther north in Steptoe Valley.

Erosion and Sedimentation

The North Plant Site would not be within or adjacent to an SDA, thus erosion and sedimentation are not issues.

Operations, Maintenance, and Abandonment

Daily operation and maintenance of the power plant would create effects similar to those described under the South Plant Site, Operations, above, with the associated changes in SDAs as noted above.

Wind Direction

These effects would be the same as those discussed under South Plant Site, Operations, above, but would be long-term in duration.

Air Quality

Effects on air quality would be similar to those discussed for the South Plant Site, Air Quality, except that modeled effects on visibility due to pollutants emitted from the North Plant Site were higher at the Jarbidge WA and lower at Zion National Park than those modeled for the South Plant Site. Due to the differing distances from SDAs effects would likely be slightly different, as discussed below.

The East Humboldt WA and Hole in the Mountain RNA would be the only SDAs directly between the North Plant Site and Jarbidge WA. The South Pequop WSA would be due north of the North Plant Site; and the Ruby Mountains WA and Seitz Canyon/Echo Lake RNA would be located northwest of the plant site. Becky Peak and Goshute Canyon WAs would be within approximately 5 and 6 miles to the west and east, respectively, of the North Plant Site. Effects to these SDAs would likely be larger than those experienced at the Jarbidge WA because they are closer to the plant site.

The High Schells WA, North-South Schells RNA, and Cleve Creek Baldy RNA would be between the North Plant Site and the Class II airshed at GBNP. These SDAs would likely intercept more air pollution than the park. Government Peak and Mount Moriah WAs, and Mount Moriah RNA are about the same distance away from the plant site as GBNP, but slightly north. Highland Ridge WA adjoins the park at its south end. These SDAs would likely experience approximately similar levels of pollutants as the park.

Effects on Goshute Peak, South Pequop and Bluebell WSAs could not be effectively evaluated because there are no air quality monitoring stations near these SDAs, nor was any air quality modeling completed for these SDAs, although they would be downwind of the North Plant Site an estimated 10 to 20 percent of the time.

These effects would be the same as those discussed under South Plant Site, Operations, above.

Noise

Noise from the operation of the North Plant Site would be the same as that described for the South Plant Site (see **Table 4.15-1** above), except that the closest SDAs potentially impacted would be the Becky Peak and Goshute Canyon WAs.

Viewsheds

These effects would be the same as those discussed under South Plant Site, Operations, above. The SDAs most impacted would be the Becky Peak and Goshute Canyon WAs, and the PET (see **Figure 4.15-11**).

Erosion and Sedimentation

The North Plant Site would not be within or adjacent to an SDA, thus erosion and sedimentation are not an issue.

4.13.3.2 Direct and Indirect Effects on Special Designations from Electric Transmission Facilities

Construction

Construction of electric transmission facilities running southward from the North Plant Site would create similar impacts to those already described under the South Plant Site, Electric Transmission Facilities.

Land Area of EEC in SDAs

The PET would be the only SDA listed in **Tables 4.13-8** or **4.13-9** below that is within the 50-mile project area of the electric transmission facilities Segments 1A, 1B, and 1C that run generally between the North and South Plant Sites. Depending on the route selected, either Segment 1A or Segment 1B would cross the PET. Segment 1C passes south of the PET. The remainder of effects due to construction of the electric transmission facilities would be the same as discussed under the South Plant Site, above.

Visitors to those SDAs that are on the boundary of Steptoe Valley would most likely be affected by visual, sound, or other impacts from the electric transmission facilities construction and/or operation. These are listed in **Table 4.13-8** below.

TABLE 4.13-8. SDAS THAT ARE WITHIN THE SAME BASIN AS THE ELECTRIC TRANSMISSION FACILITIES FOR THE NORTH PLANT SITE AND ALTERNATIVES

SDA NAME	SDA NAME
Becky Peak WA	High Schells WA
Goshute Canyon WA	PET

Visitors to those SDAs that have at least one mountain range or ridge between them and the electric transmission facilities would be less likely to see, hear, or be otherwise aware of these facilities. These SDAs are listed in alphabetical order in **Table 4.13-9** below.

TABLE 4.13-9. SDAS WITH AT LEAST ONE MOUNTAIN RANGE BETWEEN THEM AND THE ELECTRIC TRANSMISSION FACILITIES FOR THE NORTH PLANT SITE AND ALTERNATIVES

SDA NAME	SDA NAME	SDA NAME
Bald Mountain WA	Mount Grafton	Seitz Canyon/Echo Lake RNA
Bluebell WSA	Mount Moriah WA	Shellback WA
Bristlecone WA	North-South Schell Peaks RNA	South Egan Range WA
Cleve Creek Baldy RNA	Pearl Peak RNA	South Pequop WSA
Franklin WMA	Red Mountain WA	Steptoe Valley WMA
Goshute Peak WSA	Ruby Lake NWR	White Pine Range WA
Government Peak	Ruby Mountain WA	

Wind Direction

Wind direction for Steptoe Valley and within the areas of Segments 1A, 1B, 1C are the same as discussed under for the North and South Plant Sites above.

Air Quality

The estimated volume of fugitive dust created during the 24-month construction period of the entire electric transmission facilities is 1,615 tons. Segments 1A, 1B, and 1C are a small portion of this. Effects would be similar to those listed under the South Plant Site.

Noise

Changes in noise levels would be similar to those described under the South Plant Site, electric transmission facilities, **Section 4.13.2.2** above, except that the PET and the Goshute Canyon and Becky Peak WAs would be most susceptible to noise impacts. Noise effects of electric transmission facilities construction on these WAs would be short-term and negligible. Noise impacts to users of the PET would be short-term and minor to moderate if construction activities were occurring in the area at the same time of use.

Viewshed

The PET (VRM Class II) and the Becky Peak and Goshute Canyon WAs (VRM Class I), are managed to allow minimal change to the viewscape. The discussion contained under the South Plant Site, electric transmission facilities, above, applies to Segments 1A, 1B, and 1C as well.

Light Pollution

Impacts would be similar to those described under Light Pollution under the South Plant Site, Electric Transmission Facilities, above.

Erosion and Sedimentation

Impacts to SDAs from erosion and sedimentation during construction activities would be the same as described in **Section 4.13.2.2**.

Operations, Maintenance, and Abandonment

The effects from operation of the electric transmission facilities would be the same as that described in **Section 4.13.2.2**.

4.13.3.3 Direct and Indirect Effects on Special Designations from Water Supply Facilities

Effects due to construction and operation of the water supply facilities for the North Plant Site and alternatives would be similar to those described for the Proposed Action, except for the Duck Creek Impoundment water supply alternative. This would be the only water supply facilities alternative not located entirely within Steptoe Valley.

4.13.3.4 Direct and Indirect Effects on Special Designations from Rail Facilities

Effects due to construction and operation of the rail line facilities for the North Plant Site and alternatives would be similar to those described under South Plant Site, rail facilities, above, except that the rail lead would be constructed to service the North Plant Site. In addition, the Alternative Rail Line would end at the North Plant Site. The Shellback, Bald Mountain, White Pine Range, South Egan Range, and Mount Grafton WAs, and GBNP would not be within the 50-mile indirect effect area.

4.13.3.5 Mitigation

Additional mitigation measures are not required.

4.13.3.6 Unavoidable Adverse Impacts on Special Designations

Unavoidable adverse impacts caused by construction and operation of the EEC using the North Plant Site would be similar to those described under **Section 4.13.2.6**, above.

4.13.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and Irretrievable Commitments of Resources using the North Plant Site would be similar to those described under **Section 4.13.2.7**, above.

4.13.3.8 Relationship of Short-term Uses and Long-term Productivity

The relationship of Short-term Uses and Long-term Productivity would be similar to those described in **Section 4.13.2.8** above.

4.13.4 No-Action Alternative

Under the No Action Alternative there would be no air emissions as a result of the construction activities or operation related to the power plant and its associated facilities. There would be no potential impacts to flora, fauna, and water quality in SDAs related to this project. There would be no increased noise due to EEC plant and facility construction and operation, nor would there be the visual effects of a power plant with stacks in Steptoe Valley in an area that is currently dominated by rangeland.

4.14 Recreation

4.14.1 Indicators and Methods

Impacts on recreation areas and uses caused by project construction or operation were evaluated by determining the potential for:

- Conflicts with existing federal, state, and local recreation management plans and policies
- Changes in access to existing recreation areas or sites
- Changes in levels of use of existing recreation areas or sites

4.14.2 Proposed Action: South Plant Site

The Proposed Action would not conflict with existing BLM Resource Area RMPs across the project area. Management objectives related to recreation would remain viable and implementable. Construction of the water pipelines, transmission lines, and/or rail line would temporarily impact the integrity of a high-potential segment of the Pony Express National Trail (PET) and would temporarily limit public access.

The 2004 Nevada State Comprehensive Outdoor Recreation Plan (SCORP) identified the desire to protect, maintain, and increase public access to public lands as the top recreation management priority for the State of Nevada. The South and North Plant Sites would substantially limit access to the public lands involved in the disposition and ROW grant (approximately 3,000 acres). The Robinson Summit Substation site would also limit public access to approximately 82 acres. None of the other proposed project elements would significantly affect public access to public lands.

Section 3.14.3.1 details all of the existing recreation management plans that are associated with the project area. There would be no conflicts with existing county land use or recreation management plans and policies.

4.14.2.1 Direct and Indirect Effects on Recreation from Plant Site

Construction

Recreational use in the valley is largely passive and dispersed. Construction-related activities would cause visual disruption (**Section 4.15**), noise (**Section 4.16**), fugitive dust (**Section 4.6**), and increased traffic on US-93 and other local roads (**Section 4.20**). Visibility and haze effects would be similar to those summarized in **Section 4.13.2.1** on recreation resources close to the plant site. All of these factors would adversely affect normal dispersed recreation in close proximity to the 3,000 acre plant site. Increased population associated with construction would likely result in increased dispersed recreation use of area public lands. Increased dispersed recreation could create other related adverse effects such as increased incidence of resource damage from OHV use and user conflicts. Of Nevadans that recreate outdoors, 27.9 percent ride ATVs (Nevada Division of State Parks 2004). If half of the peak 2,500 workers would seek outdoor recreation opportunities, an estimate of 349 additional people may ride ATVs in the area annually. Short-term, minor impacts to dispersed recreation could result.

Hunting permits are based on herd population size and conditions, so a local increase in the worker population should not adversely affect hunting and herd populations. However, increased population in the area would likely increase competition for hunting tags and may result in an overall increase in recreational use in the area associated with hunting, particularly in Units 111 and 121 due to their proximity to project elements and population centers. Approximately 3,000 acres of habitat (particularly antelope) would be lost and construction activities would indirectly affect habitat suitability. This would displace antelope, but should not affect hunting opportunities in the area. The majority of acreage of habitat loss would be within Unit 121 where the proposed plant site would be located.

There are no developed recreational sites or areas located on the proposed power plant site, associated worker village or within the ROWs needed for the Mt. Wheeler Transmission Line to the site. There are several federal recreation sites within 50 miles of the proposed South Plant Site (**Section 3.14.3**). No direct impacts would occur at these sites and areas from construction activities. These areas would be indirectly affected by the population increase that would accompany the construction phase of the project. Greater population in the Ely and McGill areas

would likely increase the use of these recreation areas, though this may be somewhat mitigated by the recreational opportunities provided at the proposed associated worker village which is to be situated on private land.

Bassett Lake is located less than 5 miles southwest of the South Plant Site. Other than a primitive boat ramp, there are no developed facilities at the lake. Because of its close proximity to the South Plant Site, visitors to the lake may be adversely affected by the distraction of the nearby construction activities. This may diminish the annual use of the lake by historic users, but this would likely be offset by increased use of the lake and other nearby fishing opportunities by a percentage of the worker population. The 2004 SCORP indicates that of Nevadans that recreate outdoors, 25.6 percent participate in lake fishing. Assuming half of the peak 2,500 workers would seek outdoor recreation opportunities, an estimate of 320 additional people would participate in fishing opportunities in the area annually. The largemouth bass and northern pike populations are self-sustaining at current fishing levels, though recent fishing quality has been low due to an overpopulation of carp. Increased fishing temporarily may affect fish populations or require short-term stocking. Plant construction would lead to temporary, minor to moderate impacts to local recreation sites or areas.

Operations, Maintenance, and Abandonment

Sale of public lands into private ownership for the plant site would result in a decrease in public lands available for dispersed recreation. As with construction impacts, the 3,000 acre plant site would remain unavailable for antelope habitat. This would displace antelope over the long-term, but should not adversely affect hunting in the overall hunt unit. The proportion of lands lost to recreation opportunities would be small compared to the myriad dispersed recreation opportunities in the region, resulting in negligible to minor impacts.

The presence of the plant and associated facilities would cause ongoing visual impacts within Steptoe Valley for the life of the plant (**Section 4.15**), which would then become part of the landscape for dispersed recreation on federal lands within the viewshed of the plant. Operation of the plant and site facilities would impact air quality and visibility in the valley and could potentially impact visibility at recreation locations similar to SDAs (see **Section 4.13**). Ongoing noise and traffic impacts would be localized and would not likely affect federal recreation sites. Following construction, the use of all recreation sites would likely decrease to approximate pre-construction use levels.

Due to its proximity, the recreational use of Bassett Lake may remain higher than pre-construction use levels due to ongoing use by operation and maintenance staff at the plant site. Plant operations would result in long-term, minor to moderate impacts to local recreation sites or areas.

4.14.2.2 Direct and Indirect Effects on Recreation from Electric Transmission Facilities

Construction

Electric transmission lines would be constructed on lands within the Loneliest Highway, Chief Mountain, and North Delamar SRMAs. Of the 661,892 acres in the Loneliest Highway SRMA, Segments 1D, 1E, 1G, 6A, and 6C of RS-HA lines #1 and 2 would affect much less than 1 percent (501 acres) of the SRMA. The Robinson Summit substation would affect an additional 81 acres of the Loneliest Highway SRMA. Segment 8 of RS-HA line #2 would affect 245 acres of the Chief Mountain SRMA's 111,182 total acres. Segment 10 would affect 242 acres of the North Delamar SRMA's 202,892 total acres.

Electric transmission lines would also be constructed within the Ely, Caliente, and Pioche SRP Areas. Of the 218,048 acres in the Ely SRP, Segments 1D and 6C of RS-HA lines #1 and 2 would affect less than 1 percent (1,462 acres) of the SRP. Segment 6C of RS-HA lines #1 and 2 would also affect 102 acres of the Pioche SRP's 418,968 total acres. Segment 8 of line #2 would affect 152 acres of the Caliente SRP's 438,151 total acres.

Construction could be scheduled to avoid interruption of or conflict with permitted activities (motorized races, for example). As BLM lands are managed for multiple use and multiple resource values, higher priorities or other management concerns may render altering construction schedules impractical. Short-term impacts to permitted recreation activities could range from negligible to major.

There are no developed recreation sites within the proposed short-term or long-term ROWs for transmission facilities. Segment 6C does pass along the western boundary of the Chief Mountain OHV Area and Segment 8 would intersect the Silver State OHV Trail System in at least four places. The quality of dispersed recreation adjacent to the ROW could be adversely affected by visual disruption (**Section 4.15**), noise (**Section 4.16**), fugitive dust (**Section 4.6**), and increased traffic (**Section 4.20**), though this recreation use is more conducive to this type of disturbance than most dispersed recreation uses.

Segments 6C and 9D of RS-HA lines #1 and 2 would be near the Kirch Wildlife Management Area and Pahranagat National Wildlife Refuge, respectively. Segments 9D and 11 of RS-HA lines #1 and 2 would be adjacent to the Desert National Wildlife Refuge. Construction of the transmission lines may temporarily affect the presence of watchable wildlife adjacent to the ROW and along the eastern boundary of the refuge.

Recreation trails that intersect the ROW would be affected by vegetation removal within the ROW and the possibility of short-term trail closure due to construction activities.

The upgrading and use of existing access roads during construction would change the physical setting and may temporarily limit public access to active areas of transmission line construction for dispersed recreation purposes. Transmission line construction would cause temporary, minor impacts to dispersed recreation.

Operations, Maintenance, and Abandonment

Operation and maintenance activities for transmission facilities would cause long-term negligible to minor impacts to recreation activities adjacent to the ROW. Vegetation management would require the selective removal of some trees within the long-term ROW. This activity may require occasional mechanical thinning within the ROW, temporarily limiting access and introducing noise and odors that may impact the recreation experience for users in the area.

Transmission line structures would increase raptor perch sites. This would increase the possibility of raptor presence and its role as watchable wildlife, and conversely could decrease other watchable wildlife species due to increased predation. The presence of structures would also change the physical setting and introduce a visual intrusion that could affect the recreation experience for dispersed recreation users.

The presence of improved access roads to the ROWs may increase dispersed recreation (e.g., OHV) use and increase resource degradation of previously unused or little used areas. This could also increase access within the Chief Mountain OHV Area.

4.14.2.3 Direct and Indirect Effects on Recreation from Water Supply Facilities

Construction

Dispersed recreation adjacent to the ROW could be temporarily affected by visual disruption (**Section 4.15**), noise (**Section 4.16**), fugitive dust (**Section 4.6**), and increased traffic on US-93 and other local roads (**Section 4.20**).

There are no developed recreation sites within the proposed or short-term ROWs for water supply facilities. Construction of the well fields and water pipeline would have temporary negligible to minor impacts on recreation access within ERMAs. The Duck Creek Impoundment and pipeline alternative may temporarily affect access on Duck Creek Road and the recreation sites it leads to. Water supply alternatives involving the Lages Station Well Field would need to construct a pipeline across the Pony Express Trail, temporarily limiting public use of the trail. The Mt. Wheeler Transmission Line would also be constructed within this ROW and would cross over the Pony Express Trail, potentially resulting in visual impacts on users of this site (**Section 4.15**).

The upgrading and use of existing access roads during construction would change the physical setting and may temporarily limit public access for recreation purposes.

Operations, Maintenance, and Abandonment

The presence of improved access roads may increase dispersed recreation (e.g., OHV) use and increase resource degradation of previously unused or little used areas.

There would be no impacts to federal or state developed recreation sites because there are none close to the long-term ROWs.

4.14.2.4 Direct and Indirect Effects on Recreation from Rail Facilities

Construction

Dispersed recreation adjacent to the ROW could be temporarily affected during construction by visual disruption (**Section 4.15**), noise (**Section 4.16**), fugitive dust (**Section 4.6**), and increased traffic (**Section 4.20**).

There would be no impacts to federal or state developed recreation sites because there are none within the proposed ROW for the Alternative Rail Line and rail lead from Shafter to the South Plant Site.

Operations, Maintenance, and Abandonment

The operation of the Alternative Rail Line and rail lead would involve passage of multiple unit trains each day with the attendant noise and visual intrusion associated with this traffic. On average, three or more trains per day would temporarily affect road access in places for the life of the project.

4.14.2.5 Mitigation

1. Construction schedules are to be coordinated with permitted activities within the Loneliest Highway and Paranaghat SRMAs, and the Alamo and Ely SRP Areas so as to avoid conflicts.

4.14.2.6 Unavoidable Adverse Impacts on Recreation

The disposition of 2,477 acres of public land to private ownership, granting 493 acres of ROW for the power plant, and 82 acres ROW for the Robinson Summit Substation would remove these lands from public access and dispersed recreation opportunities.

4.14.2.7 Irreversible and Irretrievable Commitments of Resources

The loss of dispersed recreation use at the South Plant Site constitutes irreversible and irretrievable commitments of recreation resources.

4.14.2.8 Relationship of Short-term Uses and Long-term Productivity

Most impacts on recreation resources would result from relatively short-term construction activities, but others (such as visual or visibility impacts) would persist for the operational life of the plant. This is compared to the longer-term productivity of increasing the regional supply of electrical power in Nevada.

4.14.3 North Plant Site Alternative

Similar to the Proposed Action, the North Plant Site Alternative would not conflict with existing BLM Resource Area RMPs across the project area.

4.14.3.1 Direct and Indirect Effects on Recreation from Power Plant Site

Construction

The impacts associated with the North Plant Site would be similar to those described for the South Plant Site in **Section 4.14.2.1**, except that Bassett Lake would be affected to a lesser degree.

Operations, Maintenance, and Abandonment

The impacts associated with the North Plant Site would be similar to those described for the South Plant Site in **Section 4.14.2.1**, except that Bassett Lake would be affected to a lesser degree.

4.14.3.2 Direct and Indirect Effects on Recreation from Electric Transmission Facilities

Construction

The impacts associated with the construction of electric transmission facilities for the North Plant Site alternative would be similar to those described for the Proposed Action in **Section 4.14.2.2**, except that the Pony Express Trail would need to be spanned. This could temporarily affect access to the trail in the active construction area of the transmission line.

Operations, Maintenance, and Abandonment

The impacts associated with the operation and maintenance of electric transmission facilities for the North Plant Site alternative would be similar to those described for the Proposed Action in **Section 4.14.2.2**. The presence of the transmission lines and structures would be a long-term, minor impact to the scenic and historic integrity of the Pony Express Trail for some users.

4.14.3.3 Direct and Indirect Effects on Recreation from Water Supply Facilities

Construction

The impacts associated with the construction of water supply facilities for the North Plant Site alternative would be similar to those described for the Proposed Action in **Section 4.14.2.3**. except that the North Plant Site would not impact the Duck Creek area.

Operations, Maintenance, and Abandonment

The impacts associated with the operation and maintenance of water supply facilities for the North Plant Site alternative would be similar to those described for the Proposed Action in **Section 4.14.2.3**.

4.14.3.4 Direct and Indirect Effects on Recreation from Rail Facilities

Construction

The effects on recreation resources from the construction of the Alternative Rail Line and the rail lead for the North Plant Site would be similar to those indicated in **Section 4.14.2.4** above.

Operations, Maintenance, and Abandonment

The effects on recreation resources from the operation and maintenance of an Alternative Rail Line and rail lead for the North Plant Site would be similar to those indicated in **Section 4.14.2.4** above.

4.14.3.5 Mitigation

1. Construction schedules are to be coordinated with permitted activities within the Loneliest Highway and Paranaghat SRMAs, and the Alamo and Ely SRP Areas so as to avoid conflicts.

4.14.3.6 Unavoidable Adverse Impacts on Recreation

The disposition of 2,479 acres of public land to private ownership, granting 493 acres of ROW for the power plant, and 82 acres ROW for the Robinson Summit Substation would remove these lands from public access and dispersed recreation opportunities.

4.14.3.7 Irreversible and Irretrievable Commitments of Resources

The loss of dispersed recreation use at the North Plant Site constitutes irreversible and irretrievable commitments of recreation resources.

4.14.3.8 Relationship of Short-term Uses and Long-term Productivity

These are the same as those discussed under the Proposed Action in **Section 4.14.2.8**.

4.14.4 No Action Alternative

Under the No Action Alternative, no power plant, electric transmission facilities, access roads, water supply facilities, or any other component of the proposed project would be constructed. This would result in no change to any existing recreational land use or access in the project area.

4.15 Visual Resources

This section discusses potential impacts of the Proposed Action and Action Alternatives on visual resources, and consistency with Visual Resource Management (VRM) objectives. Potential project impacts on visibility and night skies are also discussed as separate issues not related to consistency with VRM management objectives.

4.15.1 Indicators and Methods

The following indicators were considered when analyzing potential impacts to visual resources:

- Level of contrast with established BLM VRM classes
- Visible project elements from surrounding sensitive areas

- Change in scenery, from baseline to projected, from various public and occupied points within the project area
- Change in light extinction rate
- Line of sight of night-lighted project elements from surrounding sensitive areas

The assessment of visual impacts (not including visibility and night sky impacts, which are discussed separately) is based on impact criteria and methodology described in the BLM Visual Contrast Rating System (BLM 1986b). The quality of the visual environment is defined by VRM classes. Two issues are addressed in determining impacts: (1) the type and extent of actual physical contrast resulting from a proposed action, and (2) the level of visibility of a facility, activity, or structure. Impacts are considered to be major if visual contrasts that result from landscape modifications affect the quality of: scenic resources having rare or unique values; views from, or the visual setting of, designated or planned parks, wilderness areas, natural areas, or other visually sensitive land uses; views from, or the visual setting of, travel routes; and/or views from, or the visual setting of, established, designated, or planned recreational, educational, or scientific facilities, use areas, activities, viewpoints, or vistas.

The extent to which the project would affect the visual quality of its viewshed depends on the degree of visual contrast between proposed facilities and existing landscape elements (form, line, color, texture) and features (land and water surface, vegetation, structures). Assessing the Proposed Action's contrast in this manner indicates the magnitude of potential impacts and allows for development of mitigation measures that fulfill VRM objectives.

A viewshed analysis was performed for the South and North Plant Sites to determine the area from which plant facilities could be viewed in the landscape. Visual simulations were developed to illustrate post-project conditions under the Proposed Action and the North Plant Site Alternative.

4.15.2 Proposed Action: South Plant Site

The key observation points (KOPs) discussed in **Section 3.15.3.2** are associated with various project components, as shown in **Table 4.15-1**.

TABLE 4.15-1. KOPS ASSOCIATED WITH PROPOSED ACTION

COMPONENTS	KOPS
South Plant Site	2, 3, 4, 5, 6, 7
Electric Transmission Facilities	7, 8, 9, 10, 11, 12, 13, 14
Water Supply Facilities	2, 3, 4, 5, 6
Rail Facilities	1, 2, 3, 5, 6

Appendix 4B contains Visual Contrast Rating Worksheets that were prepared based on field examination of the visual settings of each KOP. The worksheets describe the existing conditions of the characteristic landscape seen from each KOP, types of viewers, sensitivity of viewers, and other relevant information. As described in **Section 3.15.3.1**, VRM Classes have been assigned by the BLM to all the KOPs and will be used as a basis to determine the level of contrast. Described below are potential visual impacts of project elements on the landscape when viewed from the KOPs.

4.15.2.1 Direct and Indirect Effects on Visual Resources from Plant Site

Construction

The effects of construction on visual resources would begin at very low levels and increase to the maximum effect as the plant is readied for the operational phase. Construction of Phase 1 is

scheduled to take approximately 60 months. In addition to the presence of equipment, vehicles, and personnel, visual resources would likely be affected to some degree by dust generated during construction; however, the dust control BMPs presented in **Appendix 2A** would minimize this effect to the extent possible.

Operations, Maintenance, and Abandonment

The only plant component in the vicinity of KOPs 2 through 6 would be the Mt. Wheeler Transmission Line. The transmission line would be approximately 1 mile from KOP 2, 7.5 miles from KOP 3, 0.6 mile from KOP 4, 0.7 mile from KOP 5, and 0.3 mile from KOP 6. The transmission line would cross BLM land designated VRM Class II, III, and IV. Because of the distance from KOPs 2, 3, 4, and 6, the dark colored support structures would contrast weakly to moderately with the horizontal lines and vegetation of the existing views. The transmission line would not dominate the view and would be consistent with management objectives. In the vicinity of KOP 5, the transmission line crosses land designated VRM Class II (see photo simulation in **Figure 4.15-1**). At a distance of 0.7 mile, the contrast with the existing view to the west would probably not attract the attention of a casual viewer or exceed the level of change acceptable for VRM Class II lands.

Following abandonment of the Mt. Wheeler Transmission Line there would be no impact on visual resources viewed from KOPs 2 through 6 because any residual disturbance would be hidden by vegetation.

Figure 4.15-1. View to the west from KOP 5, Mt. Wheeler Transmission Line

A viewshed analysis was performed for the South Plant Site to determine the area from which the plant could be viewed in the landscape. The 727-foot tall stack would theoretically be visible from farther away than any other generation plant element; however, it is a narrow structure that would likely be inconspicuous at any distance over 10 miles, even with aircraft warning lights. The 280-foot tall boilers would be the tallest plant elements other than the stack, and should provide a more realistic idea of the area from which the plant could be visible. The viewshed analysis for the stack and boilers was based on straight line distance and intervening topographical features but no allowance was made for atmospheric conditions, light intensity, or vegetation. The viewshed for the boilers encompasses a large portion of Steptoe Valley and the sides of the mountain ranges on both sides (see **Figure 4.15-2**).

The South Plant Site would be located approximately 4.5 miles from the eastern boundary of the Bristlecone Wilderness Area in the Egan Range. This area is designated VRM Class I. The plant would be visible in the valley below and it could attract the attention of observers in the Wilderness Areas. The White Pine County Conservation, Recreation, and Development Act of 2006 (Public Law 109-432) created 12 new Wilderness Areas and expanded two existing Wilderness Areas. Section 325(a) of the law states that the wilderness designation was not intended to lead to the creation of protective perimeters or buffer zones around the designated areas. Section 325(b) states that the fact that non-wilderness activities or uses can be seen or heard from designated areas shall not preclude the conduct of those activities outside the Wilderness Area boundaries.

The South Plant Site would be within approximately 6 miles of the boundary of the High Schells Wilderness of the Humboldt-Toiyabe National Forest and within approximately 10 miles of North Schell Peak. **Figure 4.15-2** shows that the plant would be visible from portions of the Wilderness, including the highest peaks. The larger components of the Plant Site, such as the landfills and evaporation ponds, would likely be recognizable by a viewer in the Wilderness.

From KOP 7, the South Plant Site would be in the background zone. At a distance of approximately 7 miles, the South Plant Site would not dominate the view and would be consistent with management objectives for VRM Class III. It is unlikely that the Mt. Wheeler transmission line would be visible from KOP 7. **Figure 4.15-3** is a simulation of the view north from KOP 7.

Following abandonment and the removal of buildings and structures, the contrast would be greatly reduced. However, the landfills would remain and would likely continue to attract attention, even after vegetation is established. Although the landfills are near the highway, the level of contrast would only be visible for a short time by occupants of vehicles traveling up to 70 mph.

The power plant could have an effect on visibility in Steptoe Valley and nearby sensitive areas because of particulates released or formed by atmospheric processes affecting gaseous releases. As the concentration of particulates increases, more light is scattered and less passes through. As a result, visibility is decreased. Potential degradation in visibility was estimated based on modeling, as discussed in **Section 4.6, Air Resources**. The modeling results suggest that it is unlikely that the Proposed Action would have more than a minor impact on visibility at the two Class I areas studied: Zion National Park and Jarbidge Wilderness Area. An analysis of the potential for inversions to trap pollutants in Steptoe Valley showed that the exhaust plume from the proposed plant would be well above almost all evening inversions. Modeling also indicated that plant operations would not produce any noticeable increase in fog or icing along

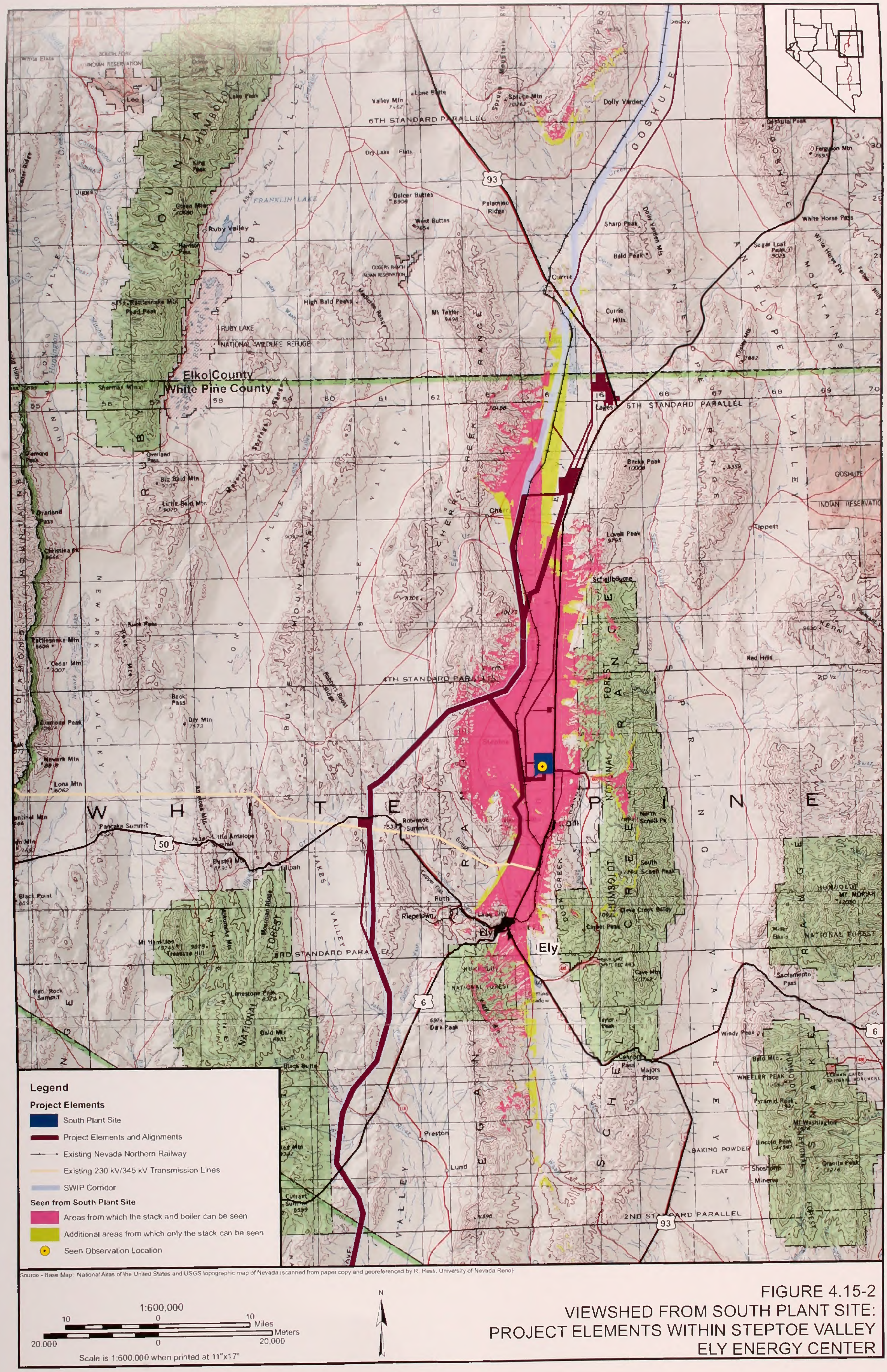


FIGURE 4.15-2
VIEWSHED FROM SOUTH PLANT SITE:
PROJECT ELEMENTS WITHIN STEPTOE VALLEY
ELY ENERGY CENTER

US-93. See **Section 4.6, Air Resources** for a full discussion of modeling methods and potential effects on visibility.

Exterior lighting associated with the power plant could also affect the visual environment of Steptoe Valley. The proposed power plant would require exterior lighting that is adequate for safe and efficient operation, and these lights have potential to affect the quality of the night sky. However, without knowing the number, wattage, and type of light fixtures, as well as the reflectivity of illuminated areas, it is not possible to quantify the potential impact of plant lighting on night skies.

Figure 4.15-3. View to the north from KOP 7, Proposed Action

According to the International Dark-Sky Association (IDA 2007), simple measures such as using approved light fixtures, using the lowest wattage lamps possible, and turning off lights when they are not needed can greatly reduce degradation of night skies. These suggestions are incorporated into mitigation measures for visual resources that are contained in **Section 4.15.2.5**. Nighttime skies in Steptoe Valley would likely be affected to some degree by exterior plant lighting under the Proposed Action, even after implementing mitigation measures. The proposed plant would tend to add to the existing dome of light over the towns and the state prison at the south end of Steptoe Valley. However, the mitigation measures should ensure that the plant's contribution to light pollution would be minimized. It is not possible at this time to quantify the potential effect on light pollution at Great Basin National Park, which is approximately 40 miles southeast of the plant site. However, with proposed mitigation the effect is likely to be considerably less than the current contribution from the town of Ely and the state prison.

4.15.2.2 Direct and Indirect Effects on Visual Resources from Electric Transmission Facilities

Construction

Construction of electric transmission facilities would begin with surveying and soil testing followed by identification of structure locations, material yards, staging areas, wire stringing and tensioning sites, and concrete batch plant sites. Equipment access would be required to every transmission structure. New roads would be constructed if necessary; existing access roads would be used where possible. As viewed from KOPs, most of the ground disturbance would be hidden by existing vegetation. Equipment and workers would be most visible when working near major roads. As structures are completed and conductors are strung, the impact of transmission facilities on visual resources would increase from minimal to the final impact associated with the operational configuration. The Robinson Summit and Harry Allen Substation worksites are not anticipated to be visible from KOPs. The construction period is estimated to be approximately 24 months. Dust control BMPs would minimize the potential impact on visibility during construction.

Operations, Maintenance, and Abandonment

Exterior lighting at the substations would contribute to degradation of night skies to some degree; however, the BMPs presented in **Appendix 2A** would minimize the impact.

The electric transmission lines would be supported by large steel H-frame, self-supporting open lattice, or guyed Vee structures, ranging from 100 to 185 feet high and spaced 900 to 1,600 feet apart, depending on terrain. Two single-circuit, parallel transmission lines would follow the proposed alignments to connect the new plant site with substations. Under the Proposed Action, electric transmission facilities would be visible from KOPs 8 through 14, but probably would not be visible from KOP 7 in McGill. The proposed transmission lines would meet VRM management objectives when viewed from these KOPs, as discussed below.

An approximately 0.7-mile length of transmission line Segment 9C would be adjacent to the western edge of the Delamar Mountains Wilderness Area, which is designated VRM Class I. Other transmission line segments would pass within approximately 0.5 mile of the Meadow Valley Range Wilderness Area, and within approximately 0.25 mile of the Arrow Canyon Wilderness Area, both of which are designated VRM Class I. The transmission lines would likely be visible and could attract the attention of observers in these Wilderness Areas. As discussed in **Section 4.15.2.1**, the fact that non-wilderness activities or uses can be seen or heard from Wilderness Areas does not preclude the conduct of those activities outside Wilderness Area boundaries.

Transmission line Segment 6C would pass through a portion of the south Schell Creek Range that is designated VRM Class II. Segment 10 would cross the Delamar Mountains, which is also designated VRM Class II. In both cases, the attention of viewers within 3 to 5 miles (i.e., the foreground-middleground) would likely be attracted by the transmission lines and management objectives would therefore not be met.

At KOP 8, Segment 1D of EEC-RS 500-kV Lines 1 and 2 crosses US-50 at nearly a right angle. The Robinson Summit Substation would be southwest of the highway crossing and would likely be hidden by rolling hills. Segments 1E and 6A 500-kV lines 1 and 2 and Segment 1G 500-kV lines 1 and 2 would also be south of the highway. The view from KOP 8 to the southwest is partly obscured by a hill that rises from highway level and blocks the land behind, as well as any project elements other than a short length of the Segment 1D transmission lines. The view from the highway to the north is also blocked by the side of a hill. A small portion of Segment 1D of

EEC-RS 500-kV transmission lines 1 and 2 would be visible from KOP 8. The closest support structures would be at least 400 feet from the highway. The contrasting vertical lines and color of the support structures would be hidden to some degree by the rolling hills. The transmission lines would attract attention, but would not dominate the view because they would be visible from vehicles on the highway for only a short distance. The management objectives for VRM Class III and IV would therefore be met. A photo simulation of the view to the southwest from KOP 8 is presented in **Figure 4.15-4**.

Figure 4.15-4. View to the southwest from KOP 8

At KOP 9 Segment 6C of RS-HA 500-kV transmission lines 1 and 2 crosses US-6. The support structures of the two transmission lines would be noticeable from approaching vehicles, and would attract attention for some distance on either side of the crossing. The closest support structures would be approximately 600 feet from the highway. The contrast between the transmission line support structures and the flat expanse and uniform color of shrubland in the valley would tend to change the existing character of the landscape, but only in the immediate vicinity of the crossing. As viewed from vehicles on the highway, the effect would be transient and management objectives for the VRM Class IV SWIP Corridor would be met. A photo simulation of the view to the northwest from KOP 9 is presented in **Figure 4.15-5**.

KOP 10 is in east Dry Lake Valley at the point where Segment 8 of RS-HA 500-kV Lines 1 and 2 would cross US-93. An existing transmission line, access road, and equipment building at this location has degraded the scenic quality of the view. The support structures of the two new transmission lines would be noticeable from approaching vehicles, and would attract attention for some distance on either side of the crossing. The contrast between the new, lighter colored, vertical support structures and the flat expanse of shrubland in the valley would tend to change the existing character of the landscape in the immediate vicinity of the crossing. As viewed from

Figure 4.15-5. View to the northwest from KOP 9, Segment 6C

Figure 4.15-6. View to the northeast from KOP 10, Segment 8

vehicles on the highway, the effect would be transient and management objectives for the VRM Class IV SWIP Corridor would be met. A photo simulation of the view to the northeast from KOP 10 is presented in **Figure 4.15-6**. **Figure 4.15-7** shows the same view with guyed VEE support structures instead of self-supporting lattice structures.

Figure 4.15-7. View to the northeast from KOP 10, Segment 8, guyed Vee structures

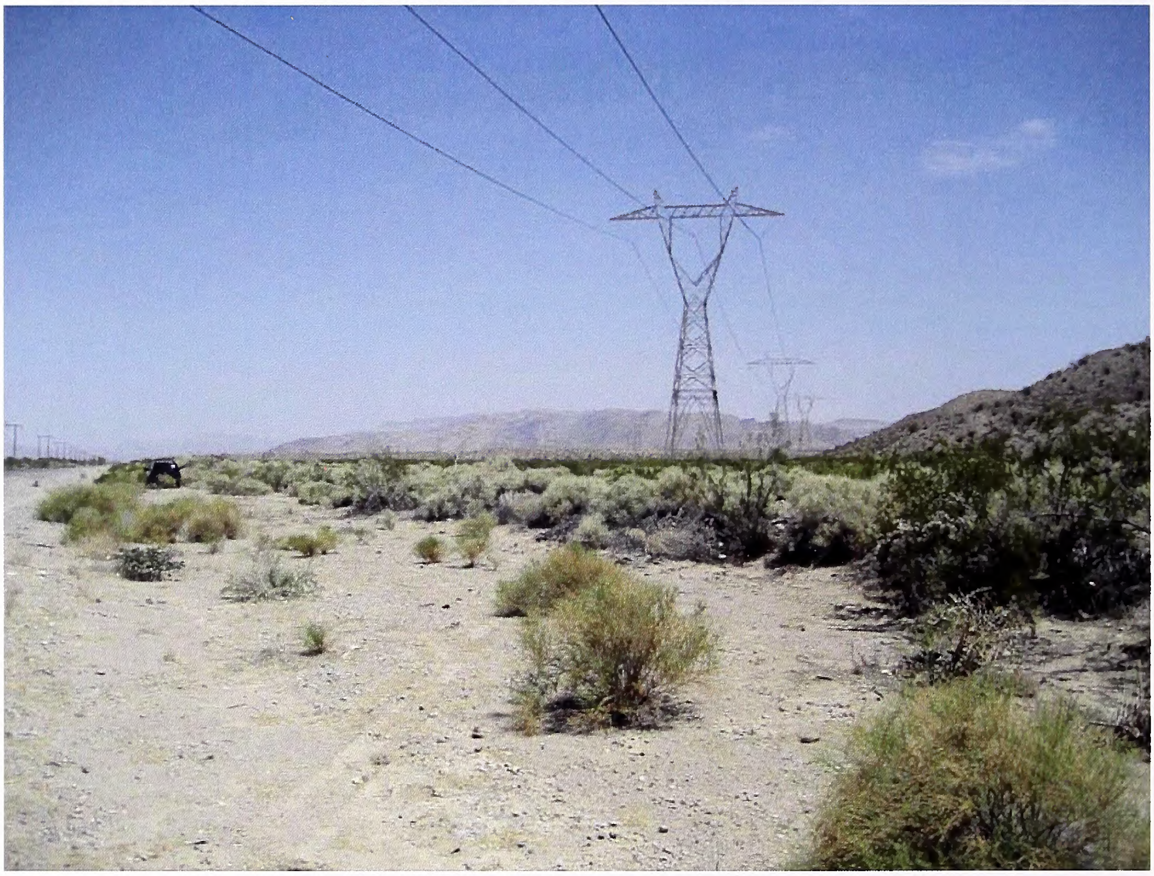
KOP 11 is on US-93 just south of the Pahranagat National Wildlife Refuge at the point where Segment 9D of RS-HA 500-kV transmission line 1 or 2 would cross the highway. The vertical structures of the proposed transmission line would contrast with the relatively undisturbed valley and hills, and would tend to attract attention from the highway. However, the nearest support structure would be approximately 600 feet away and at highway speeds, the transmission line would be visible for only a short time. The objectives for VRM Class IV in the SWIP Corridor would be met.

KOP 12 is located along US-93 near Kane Springs Valley Road where Segment 10 of RS-HA 500-kV transmission line 2 would approach the highway and the transmission line from the east. The proposed transmission line support structures would contrast with the flat terrain and uniformly-colored vegetation in the existing, relatively undisturbed landscape east of the highway. The hills on the south would help hide the transmission line. In the vicinity of the crossing, the transmission line would tend to attract attention from vehicles on the highway, but it would not dominate the view because of the short time it would be visible. The objectives for both VRM Class III and IV would be met. A photo simulation of the view from KOP 12 is presented in **Figure 4.15-8**.

KOP 13 is located on US-93 west of the Meadow Valley Mountains where Segment 11 of RS-HA 500-kV transmission lines 1 and 2 would follow the highway. The new transmission lines would be a minimum distance of 0.25 mile west of the highway, and therefore less conspicuous

than the existing H-frame transmission line. The transmission lines would be within the SWIP Corridor and VRM Class IV objectives at KOP 13 would be met. A photo simulation of the view from KOP 13 is presented in **Figure 4.15-9**.

Figure 4.15-8. View to the north from KOP 12, Segment 10



KOP 14 is located at the junction of US-93 and I-15. The Harry Allen Substation would be approximately 3.5 miles away and Segment 11 of RS-HA 500-kV transmission lines 1 and 2 would enter the switching station from the far side (i.e., from the northeast). Although a large number of observers view the valley floor from this location, the proposed facilities are far enough away that they would be inconspicuous if they are visible at all. The view from KOP 14 is already affected by dozens of transmission line support structures on the valley floor. Therefore, VRM Class IV objectives would be met.

Following abandonment, removal of support structures and switching stations, and reclamation of access roads, the visual contrast would be greatly reduced and management objectives would be met for VRM Class III and IV land when viewed from KOPs 8 through 14.

Figure 4.15-9. View to the north from KOP 13, Segment 11

4.15.2.3 Direct and Indirect Effects on Visual Resources from Water Supply Facilities

Construction

Construction of the wells and pipelines would require site clearing and grading as necessary at the well sites, staging areas, pipeline alignments, and access roads. Equipment would include graders, excavators, loaders, and trucks. The workers and equipment would be visible from US-93 along most of the proposed alignment; work on the south portion of the alignment would be too far from the highway to be noticeable. Ground disturbance would likely be hidden by surrounding vegetation. Potential impacts to visibility from dust would be minimized by the use of dust control BMPs.

Operations, Maintenance, and Abandonment

Water supply facilities would be present in the vicinity of KOPs 2 through 6. Because the pipelines are below ground, only the ground disturbance along the alignment has potential to affect visual resources. At its closest point to any of the KOPs, the water pipeline alignment would still be approximately 0.3 miles away and obscured by vegetation. The Lages Station Well Field, pumping station, and reservoir would be located on private land. Any above-ground equipment associated with the Duck Creek Impoundment Water Supply Alternative, Coyote Valley Ranch Well Field Alternative, Limited South Well Field Alternative, Middle Well Field Alternative, and South Well Field Alternative would be small enough and far enough away that it would not attract attention or contrast with the form, line, color, or texture of the existing views from KOPs. Therefore VRM Class II and III objectives would be met.

Following abandonment and removal of water supply facilities, and reclamation of disturbed ground, visual contrast would be further reduced and management objectives would be met for VRM Class II and III when viewed from KOPs 2 through 6.

4.15.2.4 Direct and Indirect Effects on Visual Resources from Rail Facilities

Construction

Construction of the Alternative Rail Line or rail lead to the South Plant Site from the existing NNRy would begin with surveying and geotechnical investigations. Access roads would be constructed to drill sites and at the three sidings on the Alternative Rail Line. Equipment would include graders, cranes, excavators, drilling rigs, and trucks. As many as 60 workers (divided into two or more crews) would be employed during construction of the Alternative Rail Line. Much of the Alternative Rail Line alignment north of US-93 crosses sparsely populated land and is unlikely to be observed. In Steptoe Valley much of the alignment is close to US-93 and workers and equipment would be observed by passing vehicles. Ground disturbance is likely to be hidden from view by surrounding vegetation. Potential impacts to visibility from dust would be minimized by the use of dust control BMPs.

Operations, Maintenance, and Abandonment

KOP 1 is located southwest of the Currie Hills on US-93 at the proposed crossing of the Alternative Rail Line. New crossing lights and signage would be installed on the highway. The rail line itself would be inconspicuous because it would be near the ground surface and obscured by surrounding vegetation on either side of the highway. Trains on the rail line would be visible at the crossing and the crossing lights and signage are designed to attract the attention of highway traffic. It is estimated that one or two loaded coal trains and one to two unloaded coal trains would cross the highway daily. The new lights and signage would contrast weakly with the form, line, color, and texture of the existing view at a distance, and contrast moderately from nearby. The Alternative Rail Line crossing at KOP 1 would be consistent with VRM Class IV objectives, which allow for a high level of change. A photo simulation of the proposed rail line highway crossing is presented in **Figure 4.15-10**.

KOP 2 is located at Lages Station, the intersection of US-93 and Alternate US-93. The distance to the Alternative Rail Line would be approximately 2.5 miles. It is unlikely that the rail line would be visible from KOP 2 except when trains are present on the tracks. The contrast in color and form of trains on the tracks would be weak because of the distance. The new rail line would not dominate the view and would be consistent with VRM Class III objectives.

The view to the east from KOP 3 is dominated by the State Highway crossing the otherwise flat valley and uniform vegetation. The boundary between land designated VRM Class II and III approximately follows the State Highway, with Class II land south of the highway. The Alternative Rail Line is 7.5 miles away on the far side of the valley floor, and even trains on the Alternative Rail Line would be difficult to see. The new rail line as viewed from KOP 3 would be consistent with VRM Class II and III objectives.

Figure 4.15-10. View to the northwest from KOP 1

KOP 5 is at the Pony Express Trail crossing of US-93, viewing west. The Alternative Rail Line would be approximately 0.6 mile away and the tracks would be hidden by shrubs. Trains on the Alternative Rail Line could attract attention from the highway because of the contrasting color and form but would not dominate the view. However, only two to four trains are anticipated per day so the effect would be transient. BLM land in the vicinity of KOP 5 is designated VRM Class II because of the historic Pony Express Trail. The viewshed of KOP 5 would be consistent with management objectives for Class II in that the level of change to the characteristic landscape would be low.

The Alternative Rail Line would be about 0.25 mile away from KOP 6 and would be hidden by vegetation. Trains on the Alternative Rail Line would be quite visible from the highway when present but would not dominate the view. Land west of KOP 6 is designated VRM Class III. The viewshed of KOP 6 to the west would be consistent with management objectives for this Class.

Following abandonment and removal of rail facilities and reclamation of disturbed ground, visual contrast would be greatly reduced and management objectives would be met for VRM Class II and III when viewed from KOPs 1 through 6.

4.15.2.5 Mitigation

Additional mitigation measures are not required.

4.15.2.6 Unavoidable Adverse Impacts on Visual Resources

During the construction period, unavoidable adverse impacts to visual resources include the presence of construction equipment and personnel, and possible fugitive dust emissions from disturbed areas that could affect visibility. During the operational phase, the largest elements of

the power plant, such as the stack and boilers, and would be visible from much of Steptoe Valley, and transmission line support structures would be visible from major road crossings.

4.15.2.7 Irreversible and Irretrievable Commitments of Resources

The Proposed Action would have no irreversible effects on visual resources because it would be possible to remove any of the proposed structures and restore disturbed vegetation. There would be an irretrievable commitment of visual resources during the active life of the project as a result of the intrusion of project elements into the existing landscape. As described in **Chapter 2**, the power plant is anticipated to have a commercial life of 50 years, followed by abandonment and possible continued industrial use. Electric transmission facilities would be used for the foreseeable future and removed only if no longer needed.

4.15.2.8 Relationship of Short-term Uses and Long-term Productivity

There are no known short-term uses of visual resources that would adversely affect the maintenance and enhancement of long-term productivity.

4.15.3 North Plant Site Alternative

The KOPs discussed in **Section 3.15.3.2** are associated with various project components, as shown in **Table 4.15-2**.

TABLE 4.15-2. KOPS ASSOCIATED WITH NORTH PLANT SITE ALTERNATIVE

COMPONENTS	KOPS
North Plant Site	2, 3, 4, 5, 6
Electric Transmission Facilities	3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14
Water Supply Facilities	2, 3, 4, 5, 6
Rail Facilities	1, 2, 3

Described below are potential visual impacts of project elements on the landscape when viewed from the KOPs.

4.15.3.1 Direct and Indirect Effects on Visual Resources from Plant Site

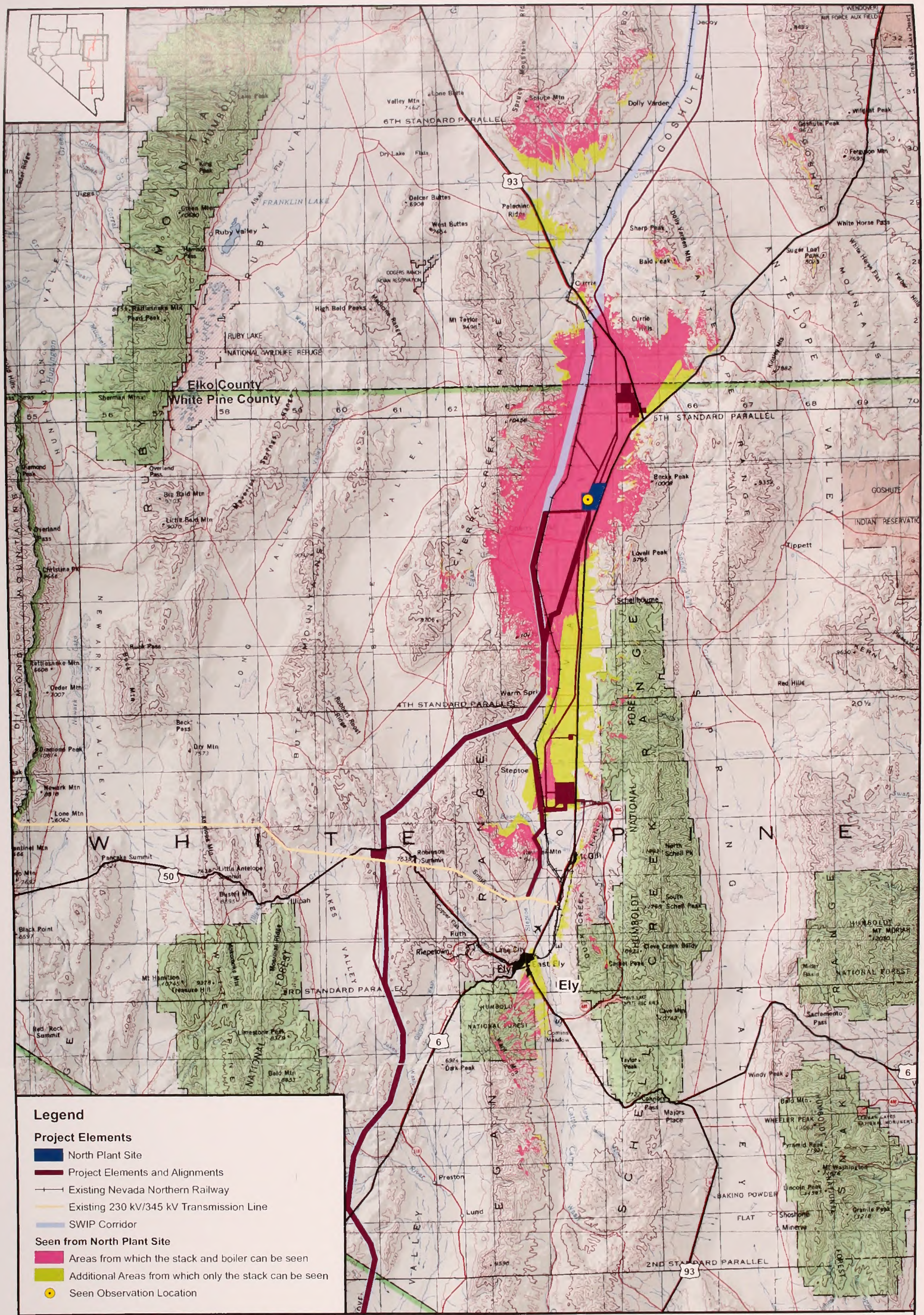
Construction

Potential effects on visual resources during construction under the North Plant Site Alternative would be essentially the same as those discussed for the Proposed Action. An associated worker village is proposed on approximately 150 acres of private land north of Lages Station. The associated worker village would be visible from US-93.

Operations, Maintenance, and Abandonment

The components of the North Plant Site are very similar to those described for the Proposed Action although the plant layout is somewhat different. A viewshed analysis was performed for the North Plant Site using the same approach as for the Proposed Action. The viewshed for the stack and 280-foot tall boilers at the North Plant Site encompasses a large portion of Steptoe Valley and the sides of the mountain ranges on both sides (see **Figure 4.15-11**). The North Plant Site is on land designated VRM Class III.

The North Plant Site would be within approximately 4.8 miles of the Goshute Wilderness Area in the Cherry Creek Range and within 2 miles of the Becky Peak Wilderness Area in the Schell Creek Range. Both these areas are designated VRM Class I. The plant would be visible in the valley below and it could attract the attention of observers in these Wilderness Areas. As discussed in **Section 4.15.2.1**, the fact that non-wilderness activities or uses can be seen or heard from Wilderness Areas does not preclude the conduct of those activities outside Wilderness Area boundaries.



Legend

Project Elements
- North Plant Site
- Project Elements and Alignments
- Existing Nevada Northern Railway
- Existing 230 kV/345 kV Transmission Line
- SWIP Corridor

Seen from North Plant Site
- Areas from which the stack and boiler can be seen
- Additional Areas from which only the stack can be seen
- Seen Observation Location

Source - Base Map: National Atlas of the United States and USGS topographic map of Nevada (scanned from paper copy and georeferenced by R. Hess, University of Nevada Reno)

1:600,000

10 0 10 Miles

20,000 0 20,000 Meters

Scale is 1:600,000 when printed at 11"x17"

N

FIGURE 4.15-11
VIEWSHED FROM NORTH PLANT SITE ALTERNATIVE:
PROJECT ELEMENTS WITHIN STEPTOE VALLEY
ELY ENERGY CENTER

The North Plant Site would be approximately 25 miles north of the High Schells Wilderness Area of the Humboldt-Toiyabe National Forest. **Figure 4.15-11** shows that the North Plant Site Alternative would be much less visible from the wilderness area than the South Plant Site.

The only plant component in the vicinity of KOP 2 would be the Mt. Wheeler Transmission Line. The transmission line would be approximately 1 mile from KOP 2 and would cross BLM land designated VRM Class III. Because of the distance from the KOP, the vertical transmission line support structures would contrast weakly to moderately with the horizontal lines of the valley and the color of existing vegetation in the existing views. The contrast would not dominate the view and would be consistent with management objectives. The North Plant Site would be hidden from view at KOP 2 by a slight rise to the south.

The North Plant Site would be on land designated VRM Class III about 8.4 miles distant from KOP 3. A photo simulation of the view from KOP 3 under North Plant Site Alternative is presented in **Figure 4.15-12**. Because of the distance to the North Plant Site, many of the facilities would be inconspicuous when viewed from KOP 3, except for the tallest and largest structures. Aircraft warning lights on the stack would attract attention and would be even more visible at night. The Mt. Wheeler Transmission Line would extend south into land designated VRM Class II; however, it would not be visible on the far side of the valley. As viewed from KOP 3, the effect of plant site components would not dominate the view and management objectives would be met.

KOP 4 is at the Pony Express Trail crossing of US-93 10 miles south of the North Plant Site viewing north. The North Plant Site would not be visible from KOP 4 because it is hidden from view by the alluvial fan on the west side of the Schell Creek Range. Only the top of the stack, as shown in **Figure 4.15-11**, would be visible and, at a distance of 10 miles, it would probably not be noticed by a casual observer. Management objectives for Class III would be met when viewed from KOP 4.

Following abandonment and removal of buildings and structures at the North Plant Site, the contrast as viewed from KOP 3 would be greatly reduced and the stack would no longer be visible from KOP 4.

The only plant component in the vicinity of KOPs 5 and 6 would be the Mt. Wheeler Transmission Line. The transmission line would be approximately 0.7 mile from KOP 5 on land designated VRM Class II. A photo simulation of the view to the west from KOP 5 is presented in **Figure 4.15-13**. At a distance of 0.7 mile, the contrast of the dark colored vertical support structures with the existing view would probably not attract the attention of a casual viewer or exceed the level of change acceptable for VRM Class II. The transmission line would be approximately 0.3 mile from KOP 6, and would cross BLM land designated VRM Class III. Because of the distance from the KOP, the transmission line would contrast moderately with the line, color, form and texture of the existing views and would be consistent with management objectives for KOP 6.

Following abandonment of the Mt. Wheeler Transmission Line there would be no impact on visual resources viewed from KOPs 2 through 6 because any residual transmission line disturbance would be hidden by vegetation.

Potential project related effects on visibility under the North Plant Site Alternative would be essentially the same as those discussed in **Section 4.15.2.1** for the Proposed Action.

Potential effects to night skies from exterior power plant lighting under the North Plant Site Alternative would be similar to those discussed in **Section 4.15.2.1** for the Proposed Action.

Figure 4.15-12. View to the east from KOP 3, North Plant Site Alternative

Figure 4.15-13. View to the west From KOP 5, Segment 1A and Mt. Wheeler Transmission Line

Nighttime skies in Steptoe Valley would likely be affected to some degree by exterior lighting under the North Plant Site Alternative, even after implementing mitigation measures. Because the North Plant Site is approximately 30 miles north of the South Plant Site, it would likely have a greater effect on nighttime skies in the north portion of Steptoe Valley because there is currently no nearby source of light pollution. Any effect on night skies at Great Basin National Park would be less than the South Plant Site because the North Plant Site would be farther away from the Park.

4.15.3.2 Direct and Indirect Effects on Visual Resources from Electric Transmission Facilities

Construction

Potential effects on visual resources during construction of the electric transmission facilities under the North Plant Site Alternative would be essentially the same as those discussed for the Proposed Action.

Operations, Maintenance, and Abandonment

Under the North Plant Site Alternative, Segment 1A (alternative) of EEC-RS 500-kV transmission lines 1 and 2 would be about 8.4 miles distant from KOP 3 and Segment 1B of EEC-RS 500-kV transmission lines 1 and 2 would be approximately 3 miles distant. A photo simulation of the view from KOP 3 under North Plant Site Alternative (with Segment 1A alternative) is presented in **Figure 4.15-12**. As viewed from KOP 3, the weak to moderate contrast of the large vertical support structures of Segment 1A with the flat, uniformly vegetated valley would meet management objectives for VRM Class III land. Segment 1B would meet management objectives for VRM Class IV land in the SWIP Corridor.

The view to the north from KOP 4 under the North Plant Site Alternative would include the north ends of Segments 1A (alternative) and 1B of EEC-RS 500-kV transmission lines 1 and 2. The visible portions of both segments would be on land designated VRM Class III. Segment 1B would be approximately 4.0 miles from KOP 4 at the closest point and Segment 1A would be approximately 0.3 mile west of US-93. Segment 1B would not tend to dominate the view from KOP 4 because of the distance. However, the large structures of Segment 1A would parallel the highway for approximately 2.8 miles and would tend to dominate the view. This level of contrast would not meet management objectives for VRM Class III.

KOP 5 is at the Pony Express Trail crossing of US-93, looking west. Under the North Plant Site Alternative, Segment 1A (alternative) transmission lines would be approximately 2 miles away from KOP 5 and Segment 1B would be over 4 miles away. The contrast of the Segment 1B support structures with the flat valley and uniform vegetation would be minimal at a distance of 4 miles. At 2 miles the contrasting shape and color of the Segment 1A support structures would probably not attract the attention of a casual observer. Therefore, the Segment 1A transmission lines would be consistent with the objectives of VRM Class II when viewed from KOP 5. A photo simulation of the view to the west from KOP 5 is presented in **Figure 4.15-13**.

Segment 1C of EEC-RS 500-kV transmission lines 1 and 2 would be over 3 miles away from KOP 6. Segment 1C would be consistent with the objectives of VRM Class IV in the SWIP Corridor.

The potential impact on visual resources as viewed from KOPs 8 through 14 would be the same as for the Proposed Action, as discussed in **Section 4.15.2.2**.

Following abandonment and removal of support structures and switching stations and reclamation of access roads, the visual contrast would be greatly reduced and management

objectives would be met for VRM Class II, III, and IV when viewed from KOPs 3 through 6 and 8 through 14.

4.15.3.3 Direct and Indirect Effects on Visual Resources from Water Supply Facilities

Construction

Potential effects on visual resources during construction of the Water Supply Alternatives under the North Plant Site Alternative would be essentially the same as those discussed for the Proposed Action.

Operations, Maintenance, and Abandonment

Potential project effects from water supply facilities would be the same as for the Proposed Action, as discussed in **Section 4.15.2.3**.

4.15.3.4 Direct and Indirect Effects on Visual Resources from Rail Facilities

Construction

Potential effects on visual resources during construction of the rail facilities under the North Plant Site Alternative would be similar to those discussed for the Proposed Action. However, the Alternative Rail Line would be nearly 34 miles shorter and construction activity would be less visible from highly traveled US-93 than under the Proposed Action.

Operations, Maintenance, and Abandonment

The effect of the Alternative Rail Line as viewed from KOP 1 would be the same as that under the Proposed Action.

The Alternative Rail Line and NNRy rail lead are on land designated VRM Class III. From KOP 2 the distance to the rail lead is approximately 6.7 miles and the Alternative Rail Line would be approximately 2.6 miles distant. It is unlikely that these facilities would be visible from KOP 2 except when trains are present on the tracks two to four times per day. The rail facilities in the viewshed to the west of KOP 2 would not dominate the view and would be consistent with management objectives.

From KOP 3 the distance to the rail lead and Alternative Rail Line is approximately 8.5 miles. It is unlikely that rail facilities would be visible from KOP 3 and even trains would probably not be noticed. The rail facilities in the viewshed to the west of KOP 3 would be consistent with management objectives.

Following abandonment and removal of rail facilities and reclamation of disturbed ground, visual contrast would be greatly reduced and management objectives would be met for VRM Class III when viewed from KOPs 2 through 3.

4.15.3.5 Mitigation

Additional mitigation measures are not required.

4.15.3.6 Unavoidable Adverse Impacts on Visual Resources

Unavoidable adverse impacts for the North Plant Site Alternative are the same as those discussed in **Section 4.15.2.6**.

4.15.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources for the North Plant Site Alternative are the same as those discussed in **Section 4.15.2.7**.

4.15.3.8 Relationship of Short-term Uses and Long-term Productivity

The relationship of short-term uses and long-term productivity for the North Plant Site Alternative are the same as those discussed in **Section 4.15.2.8**.

4.15.4 No Action Alternative

There would be no effect on visual resources from the No Action Alternative.

4.15.5 Resource Impact Summary

Most of the components of the Proposed Action and North Plant Site Alternative would meet management objectives for visual resources when viewed from the KOPs. Both plant sites are adjacent to US-93 and would be viewed by large numbers of vehicles on a daily basis. Proposed mitigation measures would help reduce the visual impact, but the plants would still dominate the view from vehicles on the highway. However, due to the high speeds (up to 70 mph) vehicles travel on the highway, the plants would dominate the view for a relatively short time when traveling either north or south in Steptoe Valley.

Transmission line Segments 6C and 10 (alternative), which cross VRM Class II land, would not meet management objectives for viewers in those locations.

4.16 Noise

4.16.1 Indicators and Methods

The primary indicator of noise levels for this and similar analyses is the A-weighted average noise level measured in decibels (L_{eq}). The one-hour average noise level (dBA L_{eq} (1 hour)) is often used to characterize ongoing operations or longer-term impact analyses. The maximum dBA level (dBA L_{max}) is used to document the highest intensity, short-term noise level. Another commonly used measure of noise impacts is L_{dn}. The L_{dn} value matches the L_{eq} value for noise generated from 7 AM to 10 PM, but accounts for increased public sensitivity to noise at night by the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB imposed on the equivalent sound levels for night time hours of 10 PM to 7 AM.

Neither Nevada nor White Pine County have regulations quantitatively limiting noise generation or impacts from the proposed project during the construction or operational phases. The EPA has prepared a Model Community Noise Control Ordinance to provide guidance for local communities or jurisdictions to design noise control regulations (EPA, no date). One of the more commonly used applications of the EPA noise control guidelines is the recommendation that noise levels should be limited to 55 dBA L_{dn} for a daily and hourly average, allowing for higher impacts for shorter term averaging periods, with a maximum noise impact of 75 dBA L_{dn} at any time in residential areas. For this analysis, application of the EPA noise control ordinance guidelines were used as a guide for assessing impacts at the nearest home, ranch, business, or identified receptor, and all identified sensitive receptors.

For the purposes of the noise impact analysis, the following qualitative terms describe the potential impact levels associated with the alternatives:

Major – Noise impacts in residential areas will exceed the thresholds set for residential areas in the commonly implemented version of the EPA Model Community Noise Control Ordinance of:

- 75 dBA L_{dn} instantaneously

- 65 dBA for 15 minute average
- 55 dBA L_{dn} for one hour or 24 hour average

Moderate – Noise impact would represent a noticeable increase over background levels that could approach but not reach the major noise impact threshold

Minor – Noise impacts could be higher than current background noise levels, but would not approach the major noise impact thresholds on any timeframe.

Negligible – Noise impacts would be at or lower than background noise levels and therefore indistinguishable from typical background noise.

For all project-related construction activity, the nearest sensitive receptor is identified, and impacts to that and other potential receptors have been assessed.

For linear components, such as pipelines, transmission lines, and rail lines, duration of activity at any particular site is expected to be brief, measured in weeks, except in staging areas. Along those linear construction lines, a qualitative assessment of impact to sensitive receptors and duration of that impact was completed.

For larger support structures outside the proposed power plant site, estimates of noise generation are described and roughly quantified, and assessments of potential impacts to sensitive receptors are provided.

For project construction outside the power plant, construction staging areas would be placed no closer than 500 feet of residences. The schedule for all project construction activity precludes the use of heavy equipment, including those with the largest construction noise producing capability, between 10 PM and 7 AM. Therefore, during construction the day/night weighted noise impacts (L_{dn}) which gives higher value to noise generated during the evening and night when the public is more sensitive, would equal the L_{eq} average noise impact.

The unit of sound level measurement (i.e., volume) is the decibel (dB), expressed as dBA (A-weighted decibel). The A-weighted decibel measure is used to evaluate ambient noise levels and common noise sources. Sound measurements in dBA give greater emphasis to sound at the mid- and high- frequency levels, which are more discernible to humans. The decibel is a logarithmic measurement; thus, the sound energy increases by a factor of 10 for every 10 dBA increase. A 3 dBA change in noise levels is considered barely perceptible, while a 5 dBA change is typically perceptible to most people.

The primary indicator of noise levels for this and similar analyses is the A-weighted average noise level measured in decibels (L_{eq}). The one-hour average noise level (dBA L_{eq} (1 hour)) is often used to characterize ongoing operations or longer-term impact analyses. The maximum dBA level (dBA L_{max}) is used to document the highest intensity, short-term noise level.

4.16.2 Proposed Action: South Plant Site

4.16.2.1 Direct and Indirect Effects on Noise from Plant Site

Construction

The project proponent has identified the equipment anticipated to be used to construct the proposed power plant, and the peripheral support infrastructure including energy transmission, water supply, rail line and rail lead, and associated worker village. Estimates of noise levels from the equipment anticipated to be used were prepared consistent with guidance from the Federal Highway Administration's Construction Handbook (FHWA 2006). Equipment routinely

used, including compressors, bulldozers, and cranes, would generate noise levels up to a maximum of 85 – 88 dBA within 50 feet of their location during operation. Multiple pieces of equipment operating simultaneously are assumed to have a maximum cumulative noise impact of 90 dBA at 50 feet. **Table 4.16-1** documents the equipment anticipated to be used during construction of the project that generate noise levels of 90 dBA or more. This equipment is expected to be used intermittently. Intermittent use of helicopters may occur for construction of peripherals, and not for construction of the power plant.

TABLE 4.16-1. HIGHER VOLUME CONSTRUCTION EQUIPMENT NOISE SOURCES

NOISE SOURCE	MEAN NOISE LEVEL AT 50'	MAXIMUM NOISE LEVEL AT 50'
Helicopter	102 dBA	105 dBA
Pile Driver	9[illegible] dBA	101 dBA
Blasting	94 dBA	N/A
Ground Scraper	90 dBA	94 dBA
Rail Saw	94 dBA	N/A
Hydraulic Ram or Hoe Ram	90 dBA	N/A
Concrete Saw	90 dBA	90 dBA

Source: Federal Highway Administration Construction Noise Handbook, (FHA 2006).

For the proposed power plant site, a qualitative estimate of noise generation is supplemented with a quantitative estimate of potential impact to sensitive receptors in the vicinity of the plant site. That estimate is based upon maximum construction activity and noise generation attenuation under environmental conditions measured or expected at the plant sites.

Noise levels were predicted for two construction scenarios: with traditional equipment operating at maximum levels during construction, and when the louder equipment identified in **Table 4.16-1** was in use. Helicopter noise impacts were not included because helicopters are not planned to be used for construction of the power plant site. Given Steptoe Valley's physical and geographic characteristics, natural attenuation of sound was conservatively estimated to be below the average expected.

The nearest residences and sensitive receptors to the south plant site would be the residents of Schoolhouse Spring Reservoir area north of McGill approximately 4 miles to the southeast. Short-term construction noise impacts in that area were estimated to be a maximum of 27 dBA with traditional construction equipment, representing little change from current background levels. Short-term construction noise levels during intermittent periods when heavier and louder equipment is in use would be 33 dBA. Those noise levels would only represent an increase over current rural background levels comparable to noise levels measured near lightly traveled roads during the intermittent periods when heavy and louder equipment is in use. The nearest sensitive receptors in any other direction are the Steptoe Ranch approximately 5.5 miles west of the South Plant Site and development in the north outskirts of McGill only slightly more distant to the south. Construction noise impacts there were estimated to be a maximum of 18 dBA with traditional construction equipment, and 27 dBA during intermittent periods when heavier and louder equipment is in use. Those impacts are at or below measured background levels, so would represent a negligible noise impact.

During the final stages of construction prior to initial power plant startup, a procedure used to clean and test piping called "steam blows" could produce substantial noise. The process involves cleaning and testing the integrity of facility steam lines. This necessary cleaning and preparation process typically occurs in brief blasts lasting two to three minutes each, several times daily over a few weeks. Steam blows can produce noise levels as high as 130 dBA at 100 feet. Those steam blows are estimated to result in noise levels up to 68 dBA L_{eq} at the nearest

Schoolhouse Spring Reservoir area residences and near 60 dBA L_{eq} at the Steptoe Ranch and in the north outskirts of McGill. During the few weeks they were necessary to verify operational integrity before start-up, the steam blows would produce brief but noticeable increases over background noise levels representing short-term moderate to major impacts.

Noise impacts to the nearest residential locations during construction of the power plant would be temporary and minor except during the brief period when steam blows, when brief, intermittent moderate impacts would be observed during daytime hours. Additional, minor noise impacts could be felt through Steptoe Valley due to increased population, traffic, and economic activity during construction.

The construction phase would also include building a worker village, with the preferred location approximately 5 miles north of the South Plant Site. The construction effort would only briefly use the louder construction equipment described for the energy center construction during the ground preparation effort. Construction noise efforts thereafter would be similar to residential construction, minor except occasionally moderate in the immediate vicinity. The associated worker village would result in new residences and residents, who would be expected to generate typical residential noise and temporarily affect Steptoe Valley noise levels to a minor degree through increased population and economic activity.

Operations, Maintenance, and Abandonment

Noise from project activity during the operational phase would primarily be generated by the power plant activity and rail traffic. Noise impacts from project linear components other than the rail lines and spurs or support structures outside the energy center area are addressed qualitatively.

The most significant sources of noise generated by activities at the energy center site are based upon technical documentation of noise generated at similar facilities and manufacturer's specifications. **Table 4.16-2** below documents the estimated noise generated by the loudest actions anticipated during operation of the EEC.

TABLE 4.16-2. POWER PLANT NOISE SOURCE EMISSIONS

PROPOSED PROJECT COMPONENT	TYPE OF SOURCE	SOUND POWER LEVEL (PWL) AT OCTAVE BAND FREQUENCY (HZ)									A-WEIGHTED	ACOUSTIC HEIGHT
		31.5	63	125	250	500	1000	2000	4000	8000		
(2) Steam Turbine Generators	Area Source	116	122	120	115	111	107	104	96	90	113	60 ft
(4) Induced Draft Fans	Area Source	–	100	112	115	115	115	112	110	106	120	16 ft
(1) Exhaust Stack	Point Source at Top	–	–	100	99	101	103	105	107	108	112	917 ft
(2) Main Transformers	Area Source	87	99	95	99	90	84	79	79	67	90	16 ft
(2) Cooling Towers	Area Source	108	111	111	108	105	101	98	95	87	107	60 ft
(1) Aux. Steam Generator	Area Source	93	97	98	95	94	94	92	91	87	99	30 ft
(1) Start Up Transformer	Area Source	108	111	105	105	108	94	91	88	88	102	16 ft
(2) 4160 V Transformers	Area Source	108	111	105	105	108	94	91	88	88	102	16 ft
(1) Diesel Generators	Area Source	84	101	96	99	97	98	99	99	110	113	16 ft

SOURCE: BIA 2007. Sources of noise at the EEC were determined to be essentially equivalent by Nevada Power.

Acoustical calculations were prepared to estimate noise levels at sensitive receptors representing the nearest residences. Noise impacts from combined power plant operations were predicted for maximum facility operating scenarios. Natural attenuation of sound was conservatively estimated to be below average given Steptoe Valley's physical and geographic characteristics. The facility is assumed to operate 24 hours per day. To account for increased public sensitivity to noise during the evening hours, L_{dn} readings include higher weighting for evening noise. On the L_{dn} scale, the same noise would rate 10 dBA higher during the evening hours than it would during daytime hours to account for more public sensitivity to noise at night. Noise impacts from operation of the power plant measured by L_{dn} values were estimated to be less than 37 dBA at all residences in Steptoe Valley. Maximum predicted L_{dn} noise impacts would be 36 dBA near Schoolhouse Spring Reservoir, and 27 to 30 dBA in and north of McGill to the south and at the Steptoe Ranch to the west. Noise from train operations offsite, and impacts including power plant operations during brief periods of train passage are documented below in **Section 4.16.2.4**.

Noise impacts to the nearest residential locations during operation of the power plant would be long-term and minor, approaching moderate impact levels at only the closest residences. Minor to moderate noise impacts could be felt through Steptoe Valley due to increased population and future economic activity.

The associated worker village is expected to be removed after construction of the energy center is complete. The breakdown of the worker village could have brief moderate noise impacts during the initial phase, then would be expected to have minor or occasional very localized moderate impacts as the removal process proceeded.

4.16.2.2 Direct and Indirect Effects on Noise from Electric Transmission Facilities

Construction

Construction activity associated with this project will involve EEC-RS transmission lines to tie into the SWIP Corridor via a substation at Robinson Summit, and run south to the Harry Allen Substation. The alternative EEC-HA transmission line alternative would follow the same routing as the EEC-RS line, but would not include a substation at Robinson Summit. The proposed route to Robinson Summit, Segment 4A, would run north northwest from the plant site to connect with the SWIP Corridor, then follow segments 1D, 1E or 1F, and 6A or 6B, not passing any closer than 1.5 miles from any residence. The alternative routing to Robinson Summit would run south from the plant site to the Gonder to Falcon transmission line, meeting the SWIP Corridor just south of Robinson Summit. That alternative would pass within 0.5 mile of structures on the Pescio Brothers property north of McGill, and within 1 mile of the nearest occupied residence in the vicinity.

Maximum construction noise impacts would be 50 dBA within 1 mile and 45 dBA at 1.5 miles with ground moving and construction equipment anticipated to be used. If helicopters are used occasionally, their noise levels could briefly reach up to 61 dBA within 1.5 mile. Construction noise impacts would be temporary and of short duration at any given location. The magnitude would be minor at all locations 1.5 miles from the transmission line during construction, potentially moderate during the brief construction period in closer proximity. Moderate noise impacts during construction extend approximately 3.5 miles from the location of activity when helicopters are in use.

There are no residences close enough to Robinson Summit to anticipate construction noise impacts above background levels measured during construction. If helicopters are used, no sensitive receptor would be expected to be subjected to noise levels over 40 dBA for any

significant duration. No Robinson Summit construction would occur under the EEC-HA transmission lines.

From Robinson Summit south to the Harry Allen Substation along the SWIP Corridor, the only residences or areas of regular human activity within 3 miles of the SWIP Corridor route would be the Coyote Springs residential and commercial development where Segment 9D meets Segment 10, and the Moapa Indian Reservation within 2 miles, with the nearest residence within 3 miles along Segment 11. Construction impacts at those locations would be temporary and minor, potentially briefly moderate at the nearest Coyote Springs lots.

Operations, Maintenance, and Abandonment

Noise generation during the operational phase along the transmission lines would be expected to be negligible and not significant compared to background levels. Maintenance efforts would be intermittent, and would have impacts similar to those described for construction, depending on the type of equipment used.

4.16.2.3 Direct and Indirect Effects on Noise from Water Supply Facilities

Construction

Construction activity associated with the Proposed Action would involve the development of a well field north of the Lages Station area, and a water line from those wells to the South Plant Site. The Lages Station Well Field would be within 0.5 miles of the store and development there, and within 1.5 miles of the nearest developed human activity area, the gas station at the intersection of US-93 and Alt 93. The pipeline from the well field would run west of US-93 south to the south plant site along the same ROW proposed for the Alternative Rail Line south of the North Plant Site Alternative. The nearest residences or sensitive receptors to that pipeline would be the Schellbourne Bar and Café 0.6 miles to the east and the residences of Monte Neva 1 mile to the west. None of those sensitive receptors would be expected to have even brief noise impacts over 50 dBA during construction of the water line. Noise impacts would be minor, approaching moderate at only the closest receptors.

Alternative or potential supplemental water developments could occur in the Middle Well Field, the Coyote Valley Ranch Well Field, the South Well Field just off the energy center site, or an impoundment in Duck Creek Valley. All well fields mentioned would be along the pipeline and the Alternative Rail Line. The nearest developed human activity area to any potential well site would be the Schellbourne Café 1 mile from the nearest Middle Well Field well site. Well construction noise generation would be comparable to that described for the Lages Station well construction.

The Duck Creek Water impoundment alternative would involve a shorter pipeline than the 44-mile line from Lages Station. The Duck Creek Valley pipeline construction effort would pass within 200 feet of residences in Duck Valley and slightly further from residences in Steptoe Valley near north McGill. Construction activities are not anticipated to be within 250 feet of any residence along the pipeline for more than a week. Construction noises as high as 75 dBA could be expected at those nearest residences for periods no longer than a few weeks during daylight hours. The nearest resident to the impoundment would be within 200 feet. Construction noise impacts would be moderate for the duration of the impoundment-related construction for nearby residences, and could occasionally be major for the nearest neighbors.

Operations, Maintenance, and Abandonment

Noise generation during the operational and maintenance phase along any of the water line alternatives would be negligible except in the immediate vicinity of pumping stations. Noise

generation at the well site(s) and associated pumping stations would be limited to the sound of electric motors and pumps and occasional maintenance efforts. Maintenance of the Duck Creek Valley impoundment could require the intermittent use of heavy equipment that would briefly have impacts comparable to those anticipated during construction. Abandonment would not be anticipated.

4.16.2.4 Direct and Indirect Effects on Noise from Rail Facilities

Construction

The Alternative Rail Line would involve building a rail line from Shafter on the UPRR line 102 miles south to the South Plant Site east of the abandoned NNRy line, an effort that would take more than a year to complete.

The construction effort would include regular use of heavy equipment that would generate noise levels under 90 dBA within 50 feet of the activity. Occasional louder equipment, possibly including rail saws or jackhammers, with noise levels up to 95 dBA within 50 feet, could be needed. Conservatively assuming a 95 dBA noise level, the nearest receptors in Currie could temporarily hear construction noise impacts as high as 90 dBA. Any impacts of that magnitude would be of brief duration, as the construction progresses down the line. The closest the Alternative Rail Line would come to any residence or human activity area would be 0.6 miles west of the Schellbourne Bar and Café. The only other residence or area of regular human use within 1 mile would be the Magnuson Ranch at 0.9 miles from the proposed rail line. Maximum short-term construction noise impacts would be below 60 dBA, and any noise approaching that level would last only a few days. The nearest residence to the power plant rail lead would be the Steptoe Ranch, more than 3 miles away if the Alternative Rail Line is built. Maximum noise levels associated with construction of the rail lead would be comparable to the noise levels from construction of the nearby power plant. Noise impacts from construction of the rail line would be temporary and minor to moderate, with moderate impacts expected to be limited to a few weeks in any one location.

During the latter stages of plant site construction, train traffic could be used to support completion of construction. Potential noise impacts during those latter construction phases could approach the noise impacts described below due to traffic during the operational phase. Actual train traffic noise impacts during the construction phase would likely be lower than during the operational phase because of lower train loads and train traffic volume.

The use of the NNRy would require construction of a 4-mile rail lead from the NNRy line to the South Plant Site. Noise generation for the rail lead construction would be comparable to that described for the Alternative Rail Line above. The only residences within 4 miles of the rail lead would be the nearest Schoolhouse Spring area residences 4 miles south and a little east, and the Steptoe Ranch 4.5 miles to the west. Noise impacts at those sites would be comparable to or less than construction noise levels discussed for the South Plant Site at the Schoolhouse Springs area. The rail lead comes closer to the Steptoe Ranch, but is comparably distant from the Schoolhouse Spring area residences.

Operations, Maintenance, and Abandonment

The proposed activity would result in 1.4 coal trains per day arriving and departing the plant site. Coal train noise levels are estimated to reach up to 88 dBA within 100 feet of the train during passage at any one point. Train noise levels exposure at residences or in areas of regular human activity near or along the rail spur to the proposed energy sites and the Alternative Rail Line have been assessed quantitatively, both individually and conservatively in conjunction with power plant operations.

Project train deliveries are expected to consist of 427 135-car coal trains annually, and up to one supply train per day. That would represent approximately 1.4 coal train and one lighter supply train round-trips per day, with full cars traveling south from Shafter, then returning north empty. Coal train passage is conservatively estimated to take 5 minutes in each direction at any point on the open line at moderate speed, longer near either end at lower speed. Supply train passages would take less time. Noise impacts are conservatively estimated based upon the 88 dBA level at 100 feet measured by the Federal Highway Administration (FHWA 2006), and 5 minutes per train pass. The nearest residences and areas of regular human activity are documented in the discussion of construction impacts above.

The closest the Alternative Rail Line would come to any residence or human activity area would be 0.6 miles west of the Schellbourne Bar and Café and within 0.9 miles of the Magnuson Ranch. Brief noise levels from passing trains at the nearest site are estimated at approximately 56 dBA, approximately five times per day. The nearest residence to the rail spur line would be the Steptoe Ranch, more than 3 miles away. Maximum train noise impacts at the ranch are estimated to be approximately 35 dBA. Those train noise impacts could raise total project noise levels at that ranch by 1 to 2 dBA over those predicted from the power plant alone.

Noise impacts to the nearest residential locations during operation of the NNRy or the Alternative Rail Line would be long-term, intermittent and minor beyond 1 to 1.5 miles from the tracks, and moderate at the few residences or business within that range. The noise impacts described are not from new noise sources, but for all receptors except those new since the 1980s they instead represent a return of train traffic and associated noise to Steptoe Valley. The Alternative Rail Line would shift historical noise impacts further east in the valley consistent with the alignment differences with the historic NNRy line.

The nearest residences or human activity areas to the NNRy include the store and residences in Currie, some within 75 feet of the tracks, and residences in or near Monte Neva slightly more distant. Noise impacts for those receptors could be as high as 90 dBA during up to five 5-minute unit train passages per day. Hourly average L_{dn} impacts are not expected to exceed 55 dBA at any residence or area of regular human activity. The receptors closest to the rail line are far enough from the South Plant Site that the combined noise impact from project activities would be little different than the impact from the trains.

4.16.2.5 Mitigation

1. For project construction outside the power plant site, construction staging areas are to be placed no closer than 500 feet of residences. The schedule for all project construction activity is to preclude the use of heavy equipment, including those with the largest construction noise producing capability, between 10 PM and 7 AM within 2 miles of sensitive receptors. The power plant and support facilities is to be maintained for efficient operation, and operated with consideration for noise impacts to off-site residences as well.

4.16.2.6 Unavoidable Adverse Impacts from Noise

While project components are being built, traditional construction and ground moving equipment would be utilized. Other louder equipment would occasionally be required, as mentioned in the discussion for project component construction impacts. Project noise from construction would be an unavoidable, temporary adverse impact.

Operational noise impacts from the power plant and rail lines would be unavoidable and long-term.

4.16.2.7 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitment of resources due to noise impacts.

4.16.2.8 Relationship of Short-term Uses and Long-term Productivity

There would be no effects on long-term productivity of resources due to noise impacts.

4.16.3 North Plant Site Alternative

4.16.3.1 Direct and Indirect Effects on Noise from Plant Site

Construction

Acoustical calculations were prepared for the North Plant Site as described for the Proposed Action to estimate noise impacts at the sensitive receptors nearby or potentially significantly impacted. Helicopter noise impacts were not included because helicopters are not planned to be used for construction of the power plant site. Given Steptoe Valley's physical and geographic characteristics, natural attenuation of sound was conservatively estimated to be below the average expected.

The nearest residences and sensitive receptors to the North Plant Site would be the residents of the J Henroid Ranch, the Fleming Ranch 4 miles to the west, and the Turner Family Trust Ranch to the west-northwest, all at least 3.5 miles from the plant site. Short-term construction noise impacts at each of those ranches were estimated to be less than 25 dBA with traditional construction equipment and under 35 dBA during intermittent periods when heavier and louder equipment would be in use. No other residence or human activity area would be expected to be impacted at over 30 dBA even briefly.

Noise impacts to the nearest residential locations during construction of the power plant would be temporary and minor, occasionally moderate only at the nearest ranch residences. Limited noise impacts would be felt through Steptoe Valley due to increased population and economic activity during construction. That effect would be concentrated near the associated worker village at Lages Station after its construction, which would be a moderate impact during the brief construction period in the immediate vicinity and minor impacts beyond.

During the final stages of construction prior to initial startup, intermittent "steam blows" lasting up to 3 minutes would each produce substantial noise. Those steam blows are estimated to result in brief noise levels up to 70 dBA L_{eq} at the nearest ranch. Those few, brief steam blows would represent moderate impacts over a 10-mile radius that could approach major impact levels at the nearest few residences.

Operations, Maintenance, and Abandonment

Acoustical calculations were prepared for the North Plant Site to estimate noise at sensitive receptors representing the nearest residences, as described for the Proposed Action. Given Steptoe Valley's physical and geographic characteristics, natural attenuation of sound was conservatively estimated to be below the average expected. The facility is assumed to operate 24 hours per day, so reported L_{dn} are higher than anticipated average L_{eq} noise levels to account for sensitivity to exposure in the evenings. Noise from train operations offsite, and impacts of power plant operations during brief periods of train passage are documented below in **Section 4.16.3.4**. Operational L_{dn} noise impacts were estimated to be less than 34 dBA at all residences, and under 25 dBA at all but the Henroid, Fleming, and Turner Family Trust Ranches.

Noise impacts to the nearest residential locations during operation of the power plant would be long-term and minor.

Abandonment of the workers village would produce brief, temporary impacts comparable to those described for construction. Those impacts would be moderate at Lages Station, and minor elsewhere.

4.16.3.2 Direct and Indirect Effects on Noise from Electric Transmission Facilities

Construction

Construction activity associated with this project would involve transmission lines to tie into the SWIP Corridor, and a switching yard at the North Plant Site. The proposed Segment 1B transmission line route would run west from the North Plant Site to the SWIP Corridor, then south along that corridor. The closest that line would come to a residence would be within 0.5 miles of the Borchert Ranch. The Segment 1A transmission line would run south-southwest to connect with the SWIP Corridor at the start of Segment 1C. The nearest residence or sensitive receptor to any point on the Segment 1A transmission line would be the Schellbourne Bar and Café approximately 2 miles to the east. With traditional equipment, maximum short-term construction noise impacts could briefly be as high as 59 dBA at Borchert Ranch near Segment 1B, but would be 45 dBA or less at all other residences. If helicopters are used occasionally, their noise levels could briefly exceed 74 dBA at the Borchert Ranch while working on the nearest segments of line, but they would not operate regularly in any location where noise impacts would be over 58 dBA at any other residence. Those noise impacts would be moderate during the brief period when construction occurred within 1 to 1.5 miles of a residence, and otherwise minor or negligible. Impacts further south down the SWIP Corridor would be as described for the South Plant Site.

Operations, Maintenance, and Abandonment

Noise generation during the operational phase along the transmission lines would be negligible and not significant compared to background levels. Maintenance efforts would be quite intermittent, but could briefly include impacts comparable to those described during construction.

4.16.3.3 Direct and Indirect Effects on Noise from Water Supply Facilities

Construction

Noise impacts related to the construction of the water supply facilities for the North Plant Site would be very similar to those described for the South Plant Site. The same proposed well field would be developed, and the pipeline would follow the same route, but it would be shorter and end farther north. If the alternative North Well Field would be developed along the pipeline in the vicinity of the plant site, it would not be within 2.5 miles of any residence. The pipeline would be approximately 15 miles shorter than under the South Plant Site alternative, shorter yet if the Middle Well Field is developed. The shorter pipeline would result in a shorter period of construction under the North Plant Site alternative, with impacts in the area of activity as described for the South Plant Site alternative.

Operations, Maintenance, and Abandonment

Noise impacts related to the operation of the water supply facilities for the North Plant Site would be essentially the same as those for the South Plant Site.

4.16.3.4 Direct and Indirect Effects on Noise from Rail Facilities

Construction

Construction activity associated with this project would involve building a rail line running from Shafter down to the North Plant Site. The primary difference between this alternative and the South Plant Site alternative is that the rail line would end further north, eliminating noise impacts

south of the North Plant Site. Construction impacts along the rail line described for the South Plant Site would be the same under this alternative as far south as the north plant site.

Using the NNRy line would include the construction of a rail lead of approximately 4 miles from the main line entering the North Plant Site from the north, with the Turner Family Ranch the only residence 1 mile from the spur the only residence within 2.5 miles of the spur line.

Operations, Maintenance, and Abandonment

Project train deliveries and traffic would be the same along the Alternative Rail Line under this alternative as described under the Proposed Action, except that the rail line would not continue south of the North Plant Site, so no impacts would occur in that area. The same methodology described for the South Plant Site analysis was implemented to estimate potential impacts along the rail line from Shafter to the North Plant Site.

No offsite rail lead would be required for the Alternative Rail Line, since the rail line would run directly into the North Plant Site.

From the NNRy rail lead, the impacts would be as described for the South Plant Site, except that all impacts south of the rail lead to the North Plant Site would be eliminated and replaced by moderate impacts at the Turner Family Trust Ranch with 5 to 7 minute impacts of up to 57.6 dBA, and minor impacts elsewhere. Brief impacts there during the 5 minute train passages could be as high as 30 dBA.

Maintenance efforts could intermittently and briefly generate noise levels comparable to those described for construction. Abandonment isn't planned, but would result only in the lack of operational train service noise if it occurred.

4.16.3.5 Mitigation

Mitigation efforts would be the same as for the Proposed Action.

4.16.3.6 Unavoidable Adverse Impacts on Noise

Unavoidable adverse impact would be the same as for the Proposed Action.

4.16.3.7 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitments of resources due to noise impacts.

4.16.3.8 Relationship of Short-term Uses and Long-term Productivity

There would be no effects on long-term productivity of resources due to noise impacts.

4.16.4 No Action Alternative

The No Action alternative would result in no construction, so there would be no noise-related construction or operational impacts associated with the Proposed Action. Alternative uses of the lands proposed for improvements not foreseeable at this time could possibly result in their own noise impacts.

4.17 Socioeconomics

Overall, construction and operation of the EEC would result in a moderate to major economic benefit for White Pine County and a negligible to minor impact on Elko and Lincoln counties. Wages and employment would increase in the area, and White Pine County would experience a major increase in tax revenues. Operation of the EEC would result in additional diversification of the east-central Nevada economy and help insulate the area against the traditional boom-bust

cycles due to heavy dependence on the metal mining industry. The impacts of operating the EEC would be long-term and permanent.

The construction phase of the EEC would create a short-term, temporary population surge in the county, with most construction workers residing in White Pine County (over 4,000 people counting workers and their families). This population surge has the potential to increase the demand for public services and strain the local infrastructure. The major mitigation for these impacts is the associated worker village included in the Proposed Action (**Section 2.2.1.1**). Other mitigation for the construction phase is being discussed between the Proponents and local agency representatives.

This economic analysis was prepared with information available in late 2007. Economic conditions in the affected area are not static and may change over time from what is described herein. Descriptions and costs for the project may also change over time in a way that is not reflected in this analysis.

4.17.1 Indicators and Methods

Social and economic impacts for the EEC were evaluated in depth for the three-county area of Elko, Lincoln, and White Pine counties in Nevada. The actual power plant would be constructed in White Pine County under both alternatives while a rail line from Shafter in Elko County would provide coal to the EEC. Lincoln County lies south of White Pine County and is within commuting distance of the Proposed Action. Elko County lies north of White Pine County and is within commuting distance of the North Plant Site.

Although the transmission line would travel through (and be constructed in) Clark and Nye counties, the economy of Clark County is orders of magnitude more robust than the economies of Elko, Lincoln and White Pine counties, and construction of the transmission line in Clark and Nye counties would be so brief and minor in impact that in depth analysis of the socioeconomic impacts of the project on Clark and Nye counties is unwarranted in this document. In fact, the economy of Clark County is so much larger than that of White Pine County (for example) that adding Clark County to the in depth analysis may have the effect of trivializing the impacts to the three-county area. **Table 4.17-1** shows personal income by county for the full five-county area and the state, and demonstrates that a project that may have a negligible effect on Clark County might have a major impact in White Pine or Lincoln County.

TABLE 4.17-1. PERSONAL INCOME TOTALS FOR FIVE COUNTIES AND THE STATE OF NEVADA FOR 2005

REGION	PERSONAL INCOME FOR 2005	REGION	PERSONAL INCOME FOR 2005
Clark County, NV	$59,793,250,000	Nye County, NV	$1,161,801,000
Elko County, NV	$1,373,054,000	White Pine County, NV	$291,403,000
Lincoln County, NV	$100,053,000	State of Nevada	$86,224,092,000

Source: U.S. Bureau of Economic Analysis, 2007a

Social and economic impacts arising from the EEC can be divided into two phases. The initial phase would result from construction of the EEC and would be temporary. The second phase would result from additional permanent employment in the three counties as a result of operating the EEC. The impact of constructing and operating the EEC would be focused primarily in White Pine County. Construction of the rail line would impact Elko and White Pine counties. The transmission line would be constructed in portions of White Pine, Lincoln, Nye

and Clark counties. Construction of the rail and transmission lines would be transitory, with crews advancing along the lines as they are built. By contrast, the power plant would be sited in White Pine County and construction workers would be located in that county throughout the construction period.

In addition to the direct employment and wages associated with construction and subsequent operation of the EEC, there would be indirect employment and wages as a result of spending by Nevada Power and its contractors in the area, and induced employment and wages as a result of spending by the workers employed by the project.

The RIMS II Input-Output model, developed by the U.S. Bureau of Economic Analysis (Bureau of Economic Analysis 2007b), was used to determine the indirect and induced economic impacts of the EEC on Elko, Lincoln and White Pine Counties. Modeling was conducted by economists for the Utah Bureau of Economic and Business Research and reported in the "Technical Report, Social & Economic Resources, Ely Energy Center Project" (Crispin and Isaacson 2008).

The economic impacts of the EEC described in this section were calculated in fall of 2007 with fiscal and employment estimates provided by Nevada Power in summer and fall of 2007. The fiscal data were based on a project permitting and construction schedule which has since been extended in time and which would result in higher costs for the project. This would mean that the economic benefits to the local economies from the project that are described in the following section are likely lower than they would actually be and are therefore conservative.

4.17.2 Proposed Action: South Plant Site

The Proposed Action is the South Plant Site approximately 10 miles north of McGill, Nevada, and consists of the power plant, rail lead from the NNRy to the plant, an underground water pipeline from Lages Station to the power plant, and new electric transmission lines. The transmission lines include switching stations at the EEC and Robinson Summit. There are options within the alternatives of constructing the Alternative Rail Line from Shafter to the site, if the NNRy rail line is unavailable; supplying water partly or wholly from other locations in Steptoe Valley; and expanding the EEC substation to accommodate the equipment slated for the Robinson Summit switching station. See Chapter 2 for a detailed description of the Proposed Action and Action Alternatives.

Tables showing employment, wages, and fiscal impacts for both the construction and operational phases of the project are shown here to provide a more complete overview of the primary social and economic impacts that the project would generate. These tables will then be referenced as appropriate in subsequent sections. Due to uncertainties in scheduling the actual construction of the project, the tables use Year 1, Year 2, etc. instead of calendar years, based on groundbreaking occurring in September of Year 1 and lasting 53 months.

Table 4.17-2 presents total estimated direct, indirect, and induced employment that would be generated in the three counties by construction and operation of the EEC Phase I. Employment is separated by major segments. The construction workforce would average 1,390 workers over a 53-month construction period with a peak of 2,342 jobs. This includes construction of the power plant, rail line, transmission lines and water line. Additionally, there would be indirect and induced employment during the construction phase. The indirect and induced employment, generated by local spending to build the EEC and spending by construction workers, would average about 353 workers annually during the construction period.

When fully operational, the EEC would employ an average of 214 people (180 workers at the power plant and 34 workers operating the rail line). The indirect and induced employment generated by the operations results in an additional 156 jobs.

TABLE 4.17-2. EMPLOYMENT IMPACTS OF THE PROPOSED ACTION

YEAR	CONSTRUCTION PHASE			OPERATIONS PHASE		
	DIRECT	INDIRECT	TOTAL	DIRECT	INDIRECT	TOTAL
Year 0	0	0	0	0	0	$0
Year 1	123	89	212	0	0	0
Year 2	732	87	819	9	3	12
Year 3	2,342	555	2,897	105	47	152
Year 4	2,326	744	3,070	184	138	322
Year 5	581	49	630	214	156	370
Year 6	13	27	40	214	156	370
Year 7	0	0	0	214	156	370
Year 8	0	0	0	214	156	370
Year 9	0	0	0	214	156	370
Year 10	0	0	0	214	156	370
Year 11	0	0	0	214	156	370
Year 12	0	0	0	214	156	370
Year 13	0	0	0	214	156	370
Year 14	0	0	0	214	156	370

Note: Full operations employment is scheduled to begin in 2014 and includes 180 workers employed at the power plant and 34 workers to operate the rail line.
Source: Crispin and Isaacson 2008

Table 4.17-3 shows data related to that in Table **4.17-2**, except that it shows wages rather than number of employees. Total employment (direct, indirect, and induced impacts of construction and pre-startup operations) peaks at 3,392 in Year 4 with $252.5 million in wages. After construction is complete and the EEC is fully operational, ongoing permanent employment in the three-county area is estimated at 370 jobs with annual wages of $25.343 million.

TABLE 4.17-3. TOTAL WAGES BY ACTIVITY ($1,000)

YEAR	CONSTRUCTION PHASE			OPERATIONS PHASE		
	DIRECT	INDIRECT	TOTAL	DIRECT	INDIRECT	TOTAL
Year 0	0	0	0	0	0	$0
Year 1	7,288	3,565.4	10,853	0	0	0
Year 2	42,912.0	6,293.8	42,205.8	500.0	110.0	611.0
Year 3	200,542.0	20,370.1	220,912.8	6,248.5	1,528.4	7,776.9
Year 4	200,765.0	29,0001.0	229,766.0	18,102.0	4,601.0	22,703.0
Year 5	34,014.0	1,882.0	35,896.0	20,102.0	5,144.0	25,343.0
Year 6	761.0	1,142.0	1,903.0	20,102.0	5,144.0	25,343.0
Year 7	0	0	0	20,102.0	5,144.0	25,343.0
Year 8	0	0	0	20,102.0	5,144.0	25,343.0
Year 9	0	0	0	20,102.0	5,144.0	25,343.0
Year 10	0	0	0	20,102.0	5,144.0	25,343.0
Year 11	0	0	0	20,102.0	5,144.0	25,343.0
Year 12	0	0	0	20,102.0	5,144.0	25,343.0
Year 13	0	0	0	20,102.0	5,144.0	25,343.0
Year 14	0	0	0	20,102.0	5,144.0	25,343.0

Source: Crispin and Isaacson 2008

Construction of the power plant itself would create most of the economic impact on the three-county area. The rail line, transmission line, and water line are a relatively smaller portion of the multi-year effort required to construct the plant. Additionally, construction of the rail and

transmission lines is more transient due to their linear nature as compared to the stationary power plant site.

Once the EEC is operational and the local economy has adapted to the higher level of employment and wages, there would be little if any continued long-term growth in the local economy due to the EEC. The local economy would still be subject to the cyclical nature of the mining industry, but the presence of the EEC would provide an additional aspect to the local economy that is not cyclical.

Fiscal Impacts

While all counties in the affected area would experience fiscal benefits resulting from the construction and operation of the EEC, most of the revenue would accrue to White Pine County. Fiscal benefits during the construction phase include sales/use taxes and property taxes (**Table 4.17-4**).

Information provided by Sierra Pacific Resources indicates that the EEC would generate an estimated $129.5 million in the affected area during the 53-month construction period. This includes $72.8 million in property taxes, and $56.7 million in sales /use taxes. On an annual basis, tax revenues are estimated to average $29.4 million per year during the construction period. The amount that accrues to White Pine County is estimated at $124.4 million and includes $72.3 million in property taxes and $52.1 million in sales and use taxes. On an annual basis, tax revenues realized by White Pine County are estimated to average $28.3 million per year during the construction phase.

TABLE 4.17-4. FISCAL IMPACTS OF THE PROPOSED ACTION IN WHITE PINE, LINCOLN AND ELKO COUNTIES

YEAR	PROPERTY TAXES	SALES AND USE TAX	TOTAL TAXES
Year 0	$2,625,398	$6,039,876	$8,665,274
Year 1	$7,817,336	$11,944,349	$19,761,685
Year 2	$12,661,578	$18,761,700	$31,423,278
Year 3	$15,468,397	$14,030,735	$29,499,132
Year 4	$16,911,175	$4,008,804	$20,919,979
Year 5	$17,307,808	$1,916,183	$19,223,991
Year 6	$16,812,058	$637,536	$17,449,594
Year 7	$16,333,322	$637,536	$16,970,858
Year 8	$15,855,586	$637,536	$16,493,122
Year 9	$15,377,851	$637,536	$16,015,387
Year 10	$14,900,096	$637,536	$15,537,632
Totals	**$152,070,605**	**$59,889.329**	**$211,959,932**

Source: Calculated by the Preparer using information provided by Sierra Pacific Power Company, 2008.

Operation of the EEC would generate long-term fiscal benefits for the area as well. The fiscal analysis presented for operations covers the first five years of full operations.

Once the EEC is fully operational, it would generate in sales/use taxes and property taxes an average of $16.5 million per year ($82.5 million over a five-year period). The largest source of tax revenues during operations is property taxes ($15.9 million annually). Sales/use taxes would average $637,536 annually, including use tax received for coal purchases. The Nevada Use Tax would be applied to the value of coal purchased to operate the power plant. Nevada allows for a tax credit equal to the amount of sales tax paid in other states. The sales tax rate in White

Pine County is 7.125 percent and the sales tax rate in Campbell County, Wyoming (site of the Powder River Basin) is 5.25 percent. At current prices for Powder River Basin coal and estimating 4.7 million tons annually for the two pulverized coal generating units, an additional $637,536 in use tax would be paid annually. These include only those taxes that accrue to Ely, Lincoln, and White Pine counties.

4.17.2.1 Direct and Indirect Effects on Socioeconomics from Plant Site

Construction

Economic Setting

The three-county area is primarily rural, with Elko, Nevada containing over 77 percent of the population of the three counties. White Pine County, site of the EEC, contains 15 percent of the 61,032 persons residing in the three–county area. Lincoln County contains the remaining 8 percent of the three-county area population. The economy of eastern Nevada has traditionally been focused on mining, with agriculture dampening some of the boom-bust cycle commonly associated with natural resource extraction. Tourism also plays a vital role in the region's economy. In the context of the area's economic history of boom and bust cycles (see **Section 3.17.3.1**), the EEC would provide a measure of economic stability that would improve both the economy and average personal income (Crispin and Isaacson 2008).

In addition to direct employment involved with constructing the power plant, there would be additional indirect employment and wages that result from spending by the construction companies and induced employment and wages that result from spending by workers in the area, as shown in **Table 4.17-5**. The east-central Nevada area is rural with limited local sources for the specialized equipment and materials required for construction. Engineers with Nevada Power estimated that approximately 1 percent of the construction funds would be expended locally. It was assumed that most of these funds would be expended on local subcontractors. Applying the final-demand multipliers for construction from the RIMS II Model for Elko, Lincoln and White Pine Counties (Bureau of Economic Analysis 2007c) to 1 percent of the value of construction (excluding equipment) indicates an additional 26 to 61 jobs would be created in the area during the construction phase with an annual payroll of $1.1 million to $2.7 million. Construction workers spending their wages in the area also results in additional economic impact. Because most of the workers would be recruited from out of the area and staying in east-central Nevada only for the duration of the project, most would be maintaining permanent residences elsewhere. Nevada Power is contracting for development and operation of a worker village for the construction phase of the project. Housing, food, laundry, and recreation areas would be provided in the associated worker village. Since most workers would be maintaining full-time residences elsewhere and many living expenses would be provided for in the associated worker village, it was assumed that 10 percent of the construction workers' wages would be spent in east-central Nevada. Applying the final-demand multipliers for the household sector from the RIMS II model to 10 percent of the workers' salaries indicates that between 26 and 142 additional jobs would be created during the construction phase in the three counties with an annual payroll of $1.1 million to $5.3 million as a result of spending by the construction workers in the area.

The construction of the EEC could affect property values in the area. The value of the power plant may increase the total assessed value of property in White Pine County by as much as seven times. This would generate a major increase in the total property value of White Pine County. In addition to the value of the power plant itself, there would be a minor to moderate increase in the value of housing in the area as demand for housing is stimulated by the permanent employees of the power plant.

Some individual property owners near the site of the power plant and transmission lines may experience some drop in property values due to impacts from air quality, visual effects and noise and similar changes in quality of life (see other sections of this EIS for descriptions of these impacts). Numerous past studies have addressed the effect of industrial facilities on nearby property values. The most common technique is a linear regression approach examining numerous variables including those such as distance to an industrial facility or concentration of pollutants such as sulfur dioxide. While these studies generally address existing conditions and do not attempt to forecast the effect of new facilities, examining them gives insights into the possible effects on constructing the EEC. Many of these past studies were reviewed in the Journal of Real Estate Literature (Boyle and Kiel 2001). One study determined that a power plant had a negative impact on local property values within 11,500 feet (2.2 miles) of the plant (Blomquist 1974). The EEC may have a negative impact on property values up to a maximum of 5 miles from the power plant. A 5-mile radius circle contains 12,566 acres, or about 0.2 percent of the land in White Pine County. Much of the land near the Proposed Action and along the transmission lines is administered by the BLM. The EEC may affect the market price of nearby lands, should the BLM sell them to private parties or other government entities (e.g., state, county or local governments). Until such time as the BLM disposes of these properties, the EEC would not affect local receipts in lieu of taxes on BLM properties. The federal government makes annual payments in-lieu of property taxes, but the amount is determined annually by congressional action and has little relationship to the actual value of the land.

TABLE 4.17-5. ECONOMIC IMPACT OF POWER PLANT CONSTRUCTION

	MULTI-PLIER[1]	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Annual Construction Cost, $1,000								
Unit 1			252,500	252,500	252,500	252,500		
Unit 2					192,500	192,500	192,000	192,500
Total Annual Construction Cost, $1,000		0	252,500	252,500	445,000	445,000	533,500	533,500
Direct Employment	3.06	0	63	692	2038	2044	581	13
Average Wage, $		58,358	58,358	58,358	58,358	58,358	58,358	58,358
Direct Earnings, $1,000		0	3,688	40,512	119,311	119,662	34,014	761
INDIRECT AND INDUCED EMPLOYMENT AND EARNINGS								
Construction Spent Locally, $1,000	1.0%	0	2,525	2,525	4,450	4,450	1,925	1,925
Employment	14.8	0	34.4	34.4	60.6	60.6	26.2	26.2
Earnings, $1,000	0.5851	0	1,477	1,477	2,604	2,604	1,126	1,126
Wages Spent Locally, $1,000	10.0%	0	369	4,051	11,931	11,966	3,401	76
Employment	7.3859	0	2.5	27.5	80.9	81.2	23.1	0.5
Earnings, $1,000	0.2221	0	82	900	2,650	2,658	755	17
Total Indirect and Induced Employment		0	36.9	61.9	141.5	141.8	49.3	26.7
Total Indirect and Induced Earnings, $1,000		0	1,559	2,377	5,254	5,261	1,882	1,142
Total Employment		0	100	754	2,180	2,186	630	40

	MULTI-PLIER[1]	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Total Earnings, $1,000		0	5,248	41,889	124,565	124,923	35,896	1,903

[1]Note: The Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the subject industry. The Employment Multiplier represents the total change in number of jobs that occurs in all industries for each additional $1 million of out output delivered to final demand by the subject industry. Because the Employment Multipliers are based on 2004 data, the output delivered should be in 2004 dollars.
Source: Crispin and Isaacson 2008

Population and Demographics

When considering both the construction workforce and Nevada Power employees, the population of White Pine County may increase by over 4,000 persons during the peak construction period, counting workers and their families **(Table 4.17-6).** The permanent increase in the area's population once construction was complete and the plant was operational would be about 805 persons, counting workers and their families.

Most of the construction workers would live in White Pine County. The project location is isolated with the closest metropolitan areas (Las Vegas, Nevada, Salt Lake City, Utah, and Provo, Utah) all approximately 250 miles from Ely, Nevada. Distances to other cities also preclude most commuting. Elko, Nevada is approximately 190 miles from Ely and Wells is 140 miles. It is expected that a small portion of the construction labor force would be drawn from the local population.

TABLE 4.17-6. ADDITIONAL POPULATION (WORKERS AND FAMILIES) UNDER THE PROPOSED ACTION; CONSTRUCTION AND OPERATIONS PHASES

YEAR	PHASE	TOTAL POPULATION
Year 0		0
Year [illegible]	Construction	332
Year 2	Construction	1,198
Year 3	Construction	4,379
Year 7	Construction	4,432
Year [illegible]	Primarily Construction	2,314
Year 6	Construction and Operation	966
Year 7	Operation	805
Year 8	Operation	805
Year 9	Operation	805
Year 10	Operation	805

Source: Crispin and Isaacson 2008

An estimated 22.5 percent of the construction workers may be relocating with families (Crispin and Isaacson 2008). At an average family size of 3.3 persons per family in the western United States (Bureau of the Census 2000l), up to 1,427 additional family members may be relocating with the construction workers building the EEC (Crispin and Isaacson 2008) at peak construction employment. Estimated population increase due to construction workers and their families is shown in **Table 4.17-6**, Years 1-6.

With this in mind, the construction of the EEC would have a major temporary impact on the population of the project area. At the peak of construction in Year 4, the population of White Pine County would increase by an estimated 48 percent over the 2006 population estimate of 9,150.

Employment and Income

Constructing the power plant, water line, and transmission lines, would have a beneficial impact on the three-county area through additional employment and wages (see **Tables 4.17-7** and **4.17-8**). In addition to the direct employment and wages associated with actual construction of the EEC, there would be additional indirect employment and wages as a result of spending by the construction companies in the area and induced employment and wages as a result spending by the workers in the area.

Since the three counties examined for social and economic impacts are rural, many of the construction workers would reside only temporarily in the area for the duration of the construction project. Many of the construction workers would have to be recruited from outside of the area.

The construction force building the power plant would average 1,230 employees over a 53-month period. There would also be employment associated with constructing the transmission lines and water supply to service the power plant.

In general, construction of the power plant itself would cause most of the economic impact on the three-county area. The rail line lead, transmission lines, and water supply facilities are a small portion of the overall impact. They are more short-term in nature than the multi-year effort necessary to build the power plant. Additionally, construction impacts of the water and transmission lines are ephemeral due to their linear nature as compared to the stationary power plant site.

The construction jobs can be divided into several different activities, the power plant itself, the rail line, transmission lines and water supply facilities serving the power plant. The power plant construction was assumed to commence in September of Year 1 and take 53 months for completion. This was based on data obtained from Nevada Power (Nevada Power 2007). Timing for construction of the rail line lead from the NNRy to the EEC, transmission lines and water supply facilities were based on estimates received from engineers working with Nevada Power. Details of the calculations of indirect and induced impacts are given in **Tables 4.17-7** and **4.17-8**.

Table 4.17-7 gives estimated employment associated with constructing the various portions of the EEC. These data include the direct employment (the construction workers actually building the facilities), and indirect and induced employment resulting from spending by Nevada Power and the construction workers in the area.

TABLE 4.17-7. TOTAL DIRECT, INDIRECT AND INDUCED EMPLOYMENT BY TYPE OF CONSTRUCTION BY ACTIVITY

YEAR	POWER PLANT	RAIL LEAD	TRANSMISSION	WATER LINE	TOTAL
Year 0	0	0	0	0	0
Year 1	100	112	0	0	212
Year 2	754	65	0	0	819
Year [illegible]	2,180	0	665	52	2,897
Year 4	2,186	0	884	0	3,070
Year 5	630	0	0	0	630
Year 6	40	0	0	0	40
Year 7	0	0	0	0	0

Source: Crispin and Isaacson 2008

Table 4.17-8 parallels **Table 4.17-7**, but gives estimated wages rather than number of employees.

TABLE 4.17-8. TOTAL DIRECT, INDIRECT AND INDUCED WAGES BY TYPE OF CONSTRUCTION BY ACTIVITY

YEAR	POWER PLANT	RAIL LEAD	TRANSMISSION	WATER LINE	TOTAL
Year 0	$0	$0	$0	$0	$0
Year 1	$5,247,000	$5,606,400	$0	$0	$10,853,400
Year 2	$42,889,000	$3,316,800	$0	$0	$46,205,800
Year 3	$124,565,000	$0	$93,807,000	$2,540,700	$220,912,700
Year [illegible]	$124,923,000	$0	$104,843,000	$0	$229,766,000
Year 5	$35,896,000	$0	$0	$0	$35,896,000
Year 6	$1,903,000	$0	$0	$0	$9,103,000

Source: Crispin and Isaacson 2008

The direct construction employment in the three counties as a result of building the power plant was provided by Nevada Power. As shown in **Table 4.17-5**, the average annual workforce is 63 in Year 1, peaks at 2,044 individuals in Year 4, and is 13 in Year 6, the last year of construction. Total construction wages were estimated by applying the average wage in Nevada for the Heavy and Civil Engineering Construction industrial sector (NAICS 237) to the estimated employment. The average wage in Nevada for this industrial sector for 2006 was $56,909 (Bureau of Labor Statistics 2007b). This average wage was updated the first half of 2007 using the Consumer Price Index. After updating, the average annual wage was estimated to be $58,358. Estimated wages for the construction workforce building the power plant are estimated to be $3.7 million in Year 1, peak at $119.7 million in Year 4 and total $761,000 in Year 6. All estimated wages are in 2007 dollars and there has been no adjustment made for future inflation.

Total new employment in the area connected to constructing the power plant is 100 jobs in Year 1, peaking at 2,186 jobs in Year 4, and 40 jobs in Year 6 (see **Table 4.17-5**). This includes jobs directly building the power plant and indirect and induced employment. These figures do not include the impact of constructing the rail lead, transmission lines or water supply facilities.

Land Ownership

Under the Proposed Action Nevada Power would purchase 2,500 acres of BLM administered land and obtain rights-of-way over an additional 500 acres. The purchase constitutes a change of ownership from public to private on 0.04 percent of White Pine County's 5,699,200 acres, of

which the federal government owns 93.53 percent (Crispin and Isaacson 2008). The effect of this change on property tax receipts is discussed under "local government and finance" below.

Agriculture

Construction of the EEC would remove land from agricultural production. The power plant itself would result in approximately 3,000 acres of federal land currently being used for grazing being utilized for plant facilities. This area represents less than one-tenth of one percent of the approximately 4.5 million acres administered by the BLM in White Pine County. Impacts to livestock grazing are discussed elsewhere in this EIS.

The Proposed Action worker village site is privately-owned and currently used for agriculture, notably hay production. The worker village would occupy 150 acres. The 2002 Census of Agriculture identified 203,106 acres of farms in White Pine County including 36,744 acres of cropland. The 150 acres used for the associated worker village is equal to less than 0.1 percent of the total amount of land being farmed in White Pine County and 0.4 percent of the land used for crops. Nearly 95 percent of the value of agricultural production in White Pine County is livestock. Livestock is grazed on both public and private lands in White Pine County and only a small percentage of lands used for agriculture in the county would be impacted by the EEC. Therefore, there would be a negligible impact on farm income in the county due to the EEC.

Housing

There is currently a shortage of workforce housing in White Pine County. Nevada Power plans to address this shortage by constructing a worker village to supply housing for most of the construction workers. Current plans call for facilities capable of housing a maximum of 2,500 workers for a 7-year period. The worker village constructed by Nevada Power would be located on 150 acres of private land north of the Proposed Action plant site (See **Figures 2.2-1** and **2.2-2**). However, there may still be significant impacts on the current housing stock if workers are not required to live in the worker village. In absence of such a requirement, an unknown number of the workers may chose to locate in Ely, McGill or Ruth to be close to schools, recreational facilities and medical facilities.

Occupancy of hotel rooms by the construction workforce may also impact tourism and social services in the county. County tourism groups have developed a clientele for special events held in the county. If there are no available motel rooms to house the persons attending these events, they may cease and not continue, even after the construction phase of the EEC is complete. Social services in White Pine County use motel vouchers to house homeless persons and victims of domestic violence.

During past construction projects, which were noticeably smaller than the EEC, many construction workers lived in private recreational vehicles parked on public land. Both White Pine County and the BLM have stated that they would like to prevent workers living on public lands in recreational vehicles. Residents in northern Steptoe Valley, location of the North Plant Site for the EEC, have especially requested prevention of scattered use of recreational vehicle as residences for the construction force.

Community Services

Impacts to community services are described in this section and subtopics for which impacts are assessed include education, law enforcement, fire and emergency response, health and social services, water supply, and solid waste.

School enrollments in the White Pine County School District have been gradually falling in recent years. There appears to be spare capacity in the school district at the moment, but requirements in the education industry are constantly changing. Many of the school buildings are aging and in need of upgrading and repair.

There would be additional school enrollments during the construction phases of the EEC. The additional burden on the White Pine County Public School System would peak at 347 students in Year 4 due to the children of construction workers. This jump in school enrollments would be temporary and would fall off by Year 5 to 98 students that would remain consistent during plant operations.

An influx of construction workers has the potential to strain the ability of the local schools to provide services to the students. However, many of the workers would be relocating without families and would not require services from local educational facilities. An estimated 22.5 percent of the construction workers may be relocating with families based on data from Nevada Power (Crispin and Isaacson 2008). At an average family size of 3.3 persons per family in the western United States (Bureau of the Census 2007m), between 121 and 1,427 additional family members may be relocating with the construction workers building the power plant (see **Table 4.17-6** above). Based on the above, plant construction is expected to have a moderate adverse impact on local schools and education systems, which would be temporary in nature.

The large work force necessary to construct the EEC would create an increased need for traffic control and law enforcement during the construction period. The White Pine County Sheriff's Office is responsible for law enforcement throughout the county and provides law enforcement in Ely. The manpower available to patrol the county is limited. The Sheriff's Office currently provides two deputies at a time to patrol the county. The Sheriff's Office has an ongoing effort to hire more deputies, but competition from Las Vegas, which pays about 20 percent higher salaries, make attracting law enforcement personnel to White Pine County difficult.

Based on past experience, the County Sheriff has stated that the crime rate in the county would increase during the construction phase of the Ely Energy Center. The number of arrests in White Pine County definitely increased during previous construction projects in the county. The number of arrests then drops sharply when the construction workforce leaves the county upon completion of the project.

Past experience with increased arrests during large construction projects coupled with the consistently full holding cell at the county jail suggests that the construction phase of the Ely Energy Center may strain law enforcement facilities in White Pine County. The increased number of arrests may also occupy the Deputy Sheriffs' time to the detriment of other county residents.

White Pine County believes that a zero tolerance policy with regards to drug and alcohol abuse among the construction workforce has the potential to greatly diminish the impacts on law enforcement.

The population of White Pine County is expected to increase by 48 percent at the peak of construction. Applying this increase to the 15 patrol officers employed by the White Pine County Sheriff's Office indicates that an additional 7 to 8 Sheriff's Deputies may be needed to manage traffic and law enforcement during construction. Because of requirements for POST training, the County would need to put the deputies on staff at least six or eight months before the additional staff is required. This would be a moderate, short-term impact on law enforcement. The security force and recreational facilities that Nevada Power would provide with the associated worker

village would help to alleviate some concerns, but would not eliminate the need for additional law enforcement personnel.

White Pine County is served by volunteer fire departments. The City of Ely has a staffed fire department supplemented by volunteers. The County currently has a cooperative agreement with the State Department of Forestry, but it is in the process of establishing a County operated fire district. The volunteer firefighters are at their place of employment during the day, complicating responses to fires and other emergencies. The McGill Fire Department is the department closest to the site of the Ely Energy Center. However, most of the firefighters associated with the McGill Fire Department are employed elsewhere, resulting in increased response times. Cherry Creek has a volunteer fire department, but has a limited number of volunteers and could not be relied upon as a primary responder. The contractor building the power plant would need to provide a fire brigade. It is anticipated that the level of fire protection would be similar to a single-engine response (Nevada Power 2007).

Any Emergency Medical Technician and ambulance services provided by Nevada Power or the contractor would be required to be part of the County Emergency Medical Service or have other arrangements made with local authorities. This would not impact local fire department response time to community emergencies, but would necessitate coordination efforts. Being part of the Emergency Medical Services involves strict protocols; involves legal issues; and allows for direct communication with hospital emergency employees. If emergency responders located at the construction site are part of the County Emergency Medical Service, they may be obligated to respond to all emergencies in the area, not just those at the construction site. Potential providers of emergency services at the construction site should initiate a conversation with the County Emergency Medical Service and William Bee Ririe Hospital to ensure proper arrangements are made. The William Bee Ririe Hospital in Ely has a fairly low occupancy rate. Routine medical care associated with the construction workforce should not pose a problem.

Construction workers would be located in White Pine County throughout the construction phase. A medical clinic building would be included in the associated worker village (Target Logistics 2007). The power plant contractor must have a first responder capable of administering first aid and transporting persons to local medical facilities. The first responder would likely be a nurse. It is unlikely there would be a doctor on site. Included in the contract to construct the power plant would be requirements to have drug and alcohol policies in place with strict enforcement (Nevada Power 2007). The smaller number of construction workers anticipated to reside in White Pine County communities outside of the worker village, and the overall need for some health care services beyond that provided in the onsite clinic, suggests a minor to moderate, temporary impact to locally established health care services.

Social services in White Pine County are generally operating at capacity. The county also has difficulties recruiting and retaining mental health care professionals. These difficulties occur even when budgets are available to pay the personnel. Other factors such as the isolation of White Pine County complicate recruiting social service and mental health professionals. There are no homeless or domestic violence shelters located in the county. Currently, a voucher system is used to provide motel rooms for persons needing shelter due either to homelessness or domestic issues. The Social Services Department in White Pine County would face pressure to place persons needing shelter if there are no vacant motel rooms due to the construction workforce living in them.

There are limited day-care facilities available in White Pine County. Almost all of the day-care facilities are operated by persons licensed to operate day-care facilities in their homes. There

are almost no child-care facilities available outside of normal working hours, making construction worker shift-work difficult for those with childcare responsibilities.

The City of Ely has sufficient water rights to serve a larger population. The distribution infrastructure may need improvement to support residential development in some areas. Most of the water is supplied by Murray Springs, but it is vulnerable to highway accidents. About 500 new connections are available for the wastewater treatment plant. McGill and Ruth have water and wastewater systems operated by a separate water district. McGill has sufficient water supply and wastewater capacity. Ruth has a shortage of both water and sewer capacity. Both McGill and Ruth have recently replaced their sewer lines. Water for construction and construction workers would not impact existing community water systems.

The landfill was projected to have a 35-year life span in 2005. There is a limited amount of capacity for construction waste. Nevada Power has previously contacted the City of Ely Municipal Utilities Department and received correspondence stating that the amount of waste projected during construction should not pose a problem (Crispin and Isaacson 2008). Based on this, construction of the EEC would have negligible short-term impacts to solid waste management at the landfill.

<u>Local Government & Finance</u>

There would be a beneficial impact on local government finances during plant construction. Nevada state sales and use taxes would be due on all construction and consumable materials used at the plant site and associated worker village. The Nevada Commission on Economic Development estimated that sales and use tax would peak at $18.7 million in Year 2 during construction of the EEC (Nevada Commission on Economic Development 2007).

Property tax revenue would increase on all real and personal property in White Pine County connected with the power plant. Total property tax is expected to rise from $2.6 million in Year 0 to $17.3 million in Year 5. **Table 4.17-9** includes fiscal impact during both the construction and operations phases of the EEC. The first five years while property taxes are rising represents the construction phase while subsequent years of level tax payment represent operations of the power plant. State sales and use tax peaks in Year 3 as tax is paid on the construction materials and then subsides as construction is completed.

TABLE 4.17-9. TAX RECEIPTS UNDER THE PROPOSED ACTION

YEAR	PROPERTY TAXES	SALES AND USE TAX	TOTAL TAXES
Year 0	$2,625,398	$6,039,876	$8,665,274
Year 1	$7,817,336	$11,944,349	$19,761,685
Year 2	$12,661,578	$18,761,700	$31,423,278
Year 3	$15,468,397	$14,030,735	$29,499,132
Year 4	$16,911,175	$4,008,804	$20,919,979
Year 5	$17,307,808	$1,916,183	$19,223,991
Year 6	$16,812,058	$637,536	$17,449,594
Year 7	$16,333,322	$637,536	$16,970,858
Year 8	$15,855,586	$637,536	$16,493,122
Year 9	$15,377,851	$637,536	$16,015,387
Year 10	$14,900,096	$637,536	$15,537,632
Totals	**$152,070,605**	**$59,889.329**	**$211,959,932**

Source: Nevada Commission on Economic Development 2007.

Electric Power Industry

The construction phase would have negligible impact on the Nevada electric power industry's ability to supply power. The local supplier, Mt. Wheeler Power, would be adding a 69-kV transmission line to supply power for construction of the EEC, associated worker village, and water supply facilities. This upgrade would improve capacity and dependability for all Mt. Wheeler customers in the project area.

Operations, Maintenance, and Abandonment

Economic Setting

Once the local economy has adapted to the higher level of employment and wages, there would be little if any continuing long-term growth in the local economy due to the EEC. After the power plant is operational, employment at the plant would be constant into the future. The local economy would still be subject to the cyclical nature of the mining industry, but the presence of the EEC would provide an additional aspect to the local economy that is not cyclical.

Operating the power plant would have a positive economic impact on east-central Nevada. There would be both direct employment at the power plant, estimated to be 180 persons at full operation, and indirect and induced employment through local purchases by Nevada Power for operating the plant and local spending by employees of the power plant. Engineers with Nevada Power provided estimates of direct employment and wages and annual amounts spent locally, which are shown in **Table 4.17-10**. Few of the major inputs for the power plant, such as coal and water treatment chemicals, can currently be purchased in east-central Nevada. The coal would most likely be sourced from the Powder River Basin in eastern Wyoming. The major items purchased locally would be office supplies and maintenance items, some contract maintenance such as welding and painting, local trucking, and water system maintenance.

In addition, limestone for flue gas desulfurization could be purchased locally. The plant would require 86,400 tons of limestone annually. There is currently one lime operation within the three county area (U.S. Geological Survey 2004b) and other mining companies may be interested in initiating limestone mining operations in the area to serve the power plant. Therefore, it was assumed that the limestone would be available locally three years after operation is commenced. Limestone was valued at $6.00 per ton, the average value for limestone used for sulfur dioxide removal in Nevada (U.S. Geological Survey 2004b). Applying the appropriate multipliers from the RIMS II model to local spending indicates that operating the power plant would result in 321 additional jobs in the three-county area with an annual payroll of just under $23 million.

A high percentage of the workers operating the power plant once construction is complete would live in White Pine County due to the distance to other communities. These households would create a demand for additional housing in the area and increase residential property values in White Pine County. Furthermore, Nevada Power has indicated that the associated worker village would be dismantled and removed from the site upon completion of the power plant (Nevada Power 2007), so there would not be a surplus amount of housing in the area depressing prices upon completion of the power plant.

Overall, the EEC would increase total property values in White Pine County. The power plant is estimated to generate an additional $59 million annually in property tax in White Pine County. This is over seven times current property tax collections in the county. Another positive impact would be additional housing for the permanent workers at the EEC. A negative impact would be

some localized property value decreases due to near proximity to the power plant and impacts such as noise and altered views. (Crispin and Isaacson 2008)

TABLE 4.17-10. ECONOMIC IMPACT OF POWER PLANT OPERATIONS

	MULTI-PLIER1	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEARS 5-14 (EA)
Annual Average Direct Employment		0	0	9	85	150	180
Total Direct Wages, $1,000		0	0	500	5,000	16,000	18,000
Indirect and Induced Employment and Wages							
Materials, $1,000		0	0	0	100	500	500
Local Retail @ 33% trade margin	33%	0	0	9	33	165	165
Employment	18.5494	0	0	0	0.6	2.8	2.8
Earnings, $1,000	0.4783	0	0	0	16	79	79
Local Construction, $1,000		0	0	0	0	450	650
Employment	14.8278	0	0	0	0	6.1	8.9
Earnings, $1,000	0.5851	0	0	0	0	263	380
Local Trucking, $1,000		0	0	0	0	50	100
Employment	13.7225	0	0	0	0	0.6	1.3
Earnings, $1,000	0.5033	0	0	0	0	25	50
Water Resources, $1,000		0	0	0	50	100	100
Employment	28.9618	0	0	0	1.3	2.7	2.7
Earnings, $1,000	0.691	0	0	0	35	69	69
Household Spending, $1,000		0	0	500	5,000	16,000	18,000
Employment	7.3859	0	0	3.4	33.9	108.5	122.1
Earnings, $1,000	0.2221	0	0	111	1,111	3,554	3,998
Limestone (tons used)		0	0	0	28,800	57,600	86,400
Value, $1,000 @ $6.00 per ton		0	0	0	173	345	518
Employment	5.9183	0	0	0	1.0	2.0	3.1
Earnings, $1,000	0.3121	0	0	0	54	108	162
Total Indirect and Induced Employment		0	0	3.4	36.8	122.8	140.7
Total Indirect and Induced Earnings, $1,000		0	0	111	1,215	4,098	4,738
Total Employment		0	0	12.4	121.8	272.8	320.7
Total Earnings, $1,000		0	0	6,215	20,098	22,738	22,738

1Note: The Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the subject industry. The Employment Multiplier represents the total change in number of jobs that occurs in all industries for each additional $1 million of out output delivered to final demand by the subject industry. Because the Employment Multipliers are based on 2004 data, the output delivered should be in 2004 dollars.
Source: Crispin and Isaacson 2008

Local residents who own land near the power plant and experience a drop in property values may not feel that the county-wide increase in property values compensates for their personal loss. They may also assign personal value to their property than cannot be measured in economic value, or place different values on different attributes that does the marketplace. They may value their specific piece of property due to family history, rural atmosphere, or lifestyle.

The impact of plant site abandonment on property values cannot be determined as it is dependent on other economic factors. Upon abandonment of the plant, there may be a temporary, adverse impact on property values due to employees leaving the area and placing their residences up for sale. The magnitude of this impact is dependent on how other economic factors are affecting the economy at the time. As an example, if metal prices are high at the time, then there may be unmet demand for local housing and the abandonment of the plant would help meet this demand, so there would be little impact on pricing. The impact is also

dependent upon subsequent use of the land. Alternatively, if a different industrial activity takes over the site and offers employment to the workers, they may not leave the area and there would be no impact on real estate values.

Population and Demographics

Nevada Power employees operating the plant would add to the local population during the operations and maintenance phase of the project (see **Table 4.17-6**). The plant would be a source of long-term, stable employment (Crispin and Isaacson 2008). The railroad would also require permanent employees during the operation of the power plant to operate and service coal supply trains from Shafter to the EEC.

Upon abandonment of the power plant, the majority of the workers could be expected to leave the area seeking other employment. Given the isolation from population centers, there is little likelihood that alternative employment opportunities would exist in White Pine County that would have salaries comparable to those paid to power plant workers. Therefore, the majority of the workers would seek employment elsewhere, taking their families with them and the population of the area would decline by approximately 800 persons.

Employment and Income

Once construction of the EEC is complete and the power plant is operational, there would be a permanent major beneficial impact on the local economy through additional employment and wages. There would also be indirect economic benefits as a result of local spending by Nevada Power to operate the plant and induced benefits of spending by employees of EEC.

Table 4.17-11 shows employment due to operation and maintenance of the power plant; this employment would be expected to continue through the life of the plant, which is designed to be 50 years. **Table 4.17-12** shows wages from the jobs shown in **Table 4.17-11**, without adjustment for inflation.

The impacts of plant site abandonment on the wages and employment in the area are likely to be minor to moderate, depending upon the re-use of the industrial site for another operation that requires local manpower support. Based upon the above referenced table, in Year 9 (which is likely to be consistent for the foreseeable future of operations), the abandonment impact would be minor if the direct employment of 180 workers, plus the indirect employment of 141 workers were maintained by facility re-use. If the plant is abandoned and not re-used, there would be a loss of employment and wages that would be a moderate impact, if the local economy does not allow for people to find employment elsewhere in the area.

TABLE 4.17-11. TOTAL EMPLOYMENT DUE TO OPERATIONS

YEAR	NEVADA POWER	RAIL LINE, DIRECT, INDIRECT & INDUCED	POWER PLANT, INDIRECT & INDUCED	TOTAL
Year 2	9	0	3	12
Year 3	85	30	37	152
Year 4	180	49	123	322
Year 6	180	49	141	370
Year 6	180	49	141	370
Year 7	180	49	141	370
Year 8	180	49	141	370
Year 9	180	49	141	370

Source: Crispin and Isaacson 2008

TABLE 4.17-12. TOTAL WAGES DUE TO OPERATIONS

YEAR	NEVADA POWER	RAIL LINE, DIRECT, INDIRECT & INDUCED	POWER PLANT, INDIRECT & INDUCED	TOTAL
Year 2	$500,000	$0	$111,000	$611,000
Year 3	$5,000,000	$1,561,900	$1,215,000	$7,776,900
Year 4	$16,000,000	$2,605,000	$4,098,000	$22,703,000
Year 5	$18,000,000	$2,605,000	$4,738,000	$25,343,000
Year 6	$18,000,000	$2,605,000	$4,738,000	$25,343,000
Year 7	$18,000,000	$2,605,000	$4,738,000	$25,343,000
Year 8	$18,000,000	$2,605,000	$4,738,000	$25,343,000
Year 9	$18,000,000	$2,605,000	$4,738,000	$25,343,000

Source: Crispin and Isaacson 2008

Agriculture

Operation, maintenance and abandonment of the EEC would have a negligible adverse impact on agriculture. The 3,000 acres used in the plant site would remain unavailable for grazing during operation. Some or all of the 150 acres used for the associated worker village may be available for agricultural production upon completion of the power plant and clearing of the site.

The impact of abandonment on agriculture is dependent upon subsequent use of the land. If there is an alternative industrial use of the land, then the 3,000 acres would remain unavailable for agriculture.

Housing

Almost all of the workers operating the power plant once construction is complete would live in White Pine County due to the distance to other communities. These households would create a demand for additional housing in the area, which would be temporary until these employees are settled. The local economy would benefit from increased home purchase or home construction efforts in the area.

Community Services

Plant operations personnel, who would be permanently located in White Pine County, would account for an additional 98 children enrolled in the local school system, beginning in Year 2. This calculation also takes into account that 58 percent of families in the western United States do not have school age children (Bureau of the Census 2000m).

Local community leaders have indicated the possibility of locating modular schooling units near the associated worker village to accommodate children of construction workers (ERM 2007). Given the declining enrollments in recent years, the approximately 100 additional students in the local school system as a result of operating the EEC should pose little or no additional burden on the local schools, particularly in light of the substantial increase in school system funding that would result from the Proposed Action. Operation and maintenance of the EEC would have minor, but long-term impacts to the education system in the area.

Abandonment of the EEC, with industrial activity of another sort likely, is not expected to adversely impact education in the area.

Operation and maintenance of the EEC is expected to increase the White Pine County population by 805 persons, or less than a 10 percent increase. This minor increase would require a level of law enforcement similar to that currently required in the County. Due to the minor population increase once construction is over, operation and maintenance of the EEC would have a negligible to minor, long-term impact to law enforcement.

The impact of abandonment on law enforcement is dependent on the future use of the land. If the facility is dismantled, then a temporary workforce visiting the area to dismantle the facility may result in a temporary increased demand for law enforcement. The issues posed by this temporary workforce would be similar in nature but smaller scale to those posed by the construction workforce.

During power plant operation, fire and emergency response for the site would be provided by Nevada Power. There would be no impact to the local fire department under operation, maintenance, or abandonment of the EEC.

Any medical and emergency response personnel would have to be part of the County Emergency Medical Service or make alternative arrangements to coordinate efforts with county personnel and hospital emergency response.

If the power plant emergency personnel were part of the County Emergency Medical Service, then they may be legally obligated to respond to emergencies unconnected with operation of the power plant. This would represent a minor, long-term, beneficial impact on the county. Both the McGill and Cherry Creek Fire Departments are manned by volunteers who are at their places of employment during the day. The presence of alternative emergency response personnel in the area may shorten response times.

The impact of the Proposed Action on health and social services would be focused on White Pine County. During operation and maintenance, there would be minor to moderate, long-term impacts to health and social services, based on the increased population (Crispin and Isaacson 2008).

Abandonment of the EEC would not be expected to adversely impact health and social services in the area.

The well field and water requirements for the operation of the EEC should have negligible impacts to community water supply systems. Community water supply systems for Ely and McGill have ample water rights and capacity to serve new residents. However, the level of Murry Springs is declining recently and the city has identified a priority new water source to supplement Murry Springs.

The largest solid waste stream produced at the plant, combustion byproducts, would be handled at the plant site with no impacts to the local community landfill. Smaller waste streams like office and shop trash would be disposed of at the local municipal landfill. Operation and maintenance would not impose capacity issues at the local landfill and therefore would have negligible long-term impacts to solid waste capacity.

<u>*Local Government Finances*</u>

Increased sales, use, and property taxes would continue during the operations phase of the EEC. White Pine County would receive the largest portion of estimated tax revenues. White Pine County would receive approximately $15.8 million in property tax revenues annually and virtually all of the sales/use tax revenues (**Table 4.17-9**). The fiscal analysis of constructing and operating the EEC does not address the fiscal impacts associated with indirect or induced activity.

Sales tax would be due on any materials purchased in White Pine County, and Nevada use tax is payable on any material imported to Nevada from other states. The Nevada use tax is levied at the same rates as the sales tax, but a tax credit is allowed for sales taxes paid in the state of origin. The sales and use tax is estimated to peak at $31.4 million in Year 2.

An additional $6.5 million in annual sales taxes, above those forecast by the Nevada Commission on Economic Development, are expected to be generated by local purchases made for operating the power plant and employee spending. Nevada Use Tax would be due on the value of the coal purchased to operate the power plant. Nevada allows for a tax credit equal to the amount of sales tax paid in other states. The sales tax rate in White Pine County is 7.125 percent and the sales tax rate in Campbell County, Wyoming (site of the Powder River Basin) is 5.25 percent. At current prices of Powder River Basin coal, and estimating 4.7 million tons annually for the two pulverized coal generating units, an additional $637,536 in use tax would be paid annually.

Electric Power Industry

Operation of the EEC would have major beneficial impacts on the electric power industry in Nevada. These impacts would be long-term and last as long as the power plant is operational. The EEC represents a noticeable addition to the generating capacity for Nevada Power and the State of Nevada. The first two generating units (Phase 1) with a combined capacity of 1,500 MW provide a 17 percent increase over the 8,619 MW total summer generating capacity in Nevada as of 2005 (Crispin and Isaacson 2008). The first two units of the EEC would increase the generating capacity operated by Sierra Pacific Resources by 46 percent over the 3,235.7 MW of its installed capacity at the end of 2005.

Population projections by the Nevada State Demographers Office indicate that the population of Nevada would increase by 40 percent from 2010 to 2025, from 3,087,428 persons to 4,315,334 persons. Most of this increase would occur in Clark County, the major service area of Nevada Power. Over the 2010 to 2025 time frame, the population in Clark County is projected to increase from 2,281,997 persons to 3,299,623 persons, a 45 percent increase (Nevada State Demographers Office, 2007). Demand for electric power has increased steadily in Nevada with population. Demand averaged 13,389 KW-hrs per person from 1990 to 2005. Past experience indicates that future demand for electric power in Nevada would increase in-line with population. The EEC would meet a large portion of future demand for electricity in Nevada.

The transmission portion of the EEC would tie together the electric power systems of southern and northern Nevada. The additional transmission capacity would aid in balancing generating capacity and demand throughout the state and facilitate development of renewable resources for electricity generation in the state because of the new powerline infrastructure that would be put in place.

4.17.2.2 Direct and Indirect Effects on Socioeconomics from Electric Transmission Facilities

Construction

Associated with the EEC Proposed Action is the construction of approximately 270 miles of new transmission line. Due to the rural nature of the area, almost all of the construction materials used to construct the transmission line would have to be purchased outside of the area and shipped to the site of construction. The material to be purchased locally includes gravel and ready-mix concrete, gasoline, diesel fuel, lumber, paint and similar items. Engineers designing the transmission lines provided estimates of the amount of material purchased locally and the construction hours necessary to build the transmission line. Local spending and wages were allocated to the various counties according to the amount of transmission line to be built in each county. Since most of the workers constructing the transmission lines would not be hired locally, they would be maintaining permanent residences elsewhere. Therefore, it was assumed 50

percent of the wages would be spent locally. Applying the RIMS II multipliers to the estimated spending results in the employment and wages presented in **Table 4.17-13**.

TABLE 4.17-13. ECONOMIC IMPACT OF TRANSMISSION LINE CONSTRUCTION

	MULTIPLIER	YEAR 3	YEAR 4
Annual Average Employment		276.6	281.5
Total Wages Paid, $1,000		$79,656	$81,103
Gravel, $1,000		$989	$2,733
Ready-Mix-Concrete, $1,000		$20,740	$32,801
Total Mineral Product Manufacturing, $1,000		$12,857	$37,534
Employment	9.012	106.5	294.1
Earnings, $1,000	0.3874	$4,981	$13,765
Gasoline, Diesel fuel, lubricants, $1,000		$1,978	$5,467
Lumber, paint, other similar, $1,000		$79	$218
Total Retail, $1,000		$2,058	$5,686
Retail at 33% trade margin, $1,000	33%	$679	$1,876
Employment	18.5494	11.6	31.9
Earnings, $1,000	0.4783	$32.5	$897
Local Spending of Wages, 50% of wages	50%	$39,828	$40,551
Employment	7.3859	270.2	276.0
Earnings, $1,000	0.2221	$8,846	$8,707
Total Indirect & Induced Employment		388.3	601.8
Total Indirect & Induced Earnings, $1,000		$14,151	$23,740
Total Employment		664	883
Total Earnings, $1,000		$93,807	$104,843

Source: Crispin and Isaacson 2008

Note: The Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the subject industry. The Employment Multiplier represents the total change in number of jobs that occurs in all industries for each additional $1 million of out output delivered to final demand by the subject industry. Because the Employment Multipliers are based on 2004 data, the output delivered should be in 2004 dollars.

Construction of the transmission line would be in portions of White Pine, Lincoln, Nye and Clark counties.

The workforce constructing the transmission lines and electrical substations would stay in the associated worker village, in various communities in the three-county area, and in Clark County. Under the Proposed Action, the crews building the lines from the power plant to the Robinson Summit area would most likely reside in White Pine County while the crews building the transmission line from Robinson Summit south to the Harry Allen Substation in Clark County would live in White Pine, Lincoln and Clark counties. The place of residence for the workers would change as the line progresses to minimize travel time. This change in place of workers' residences would create short-term demand for housing along the route of the transmission line. Because of this transitory nature, few of them would be traveling with families and they would place little if any burden on the local school system.

Operations, Maintenance, and Abandonment

The new transmission lines would tie together the Proponents' electric power system in Nevada. Currently, the electric system in Clark County is in the Arizona/New Mexico/Southern California power area and there is little integration or connection with the remainder of Nevada, which is in the Northwest Power Pool. The additional transmission lines would be a major connection between the Northwest Area Power Pool and the Arizona/New Mexico/Southern Nevada Power Area. This would allow for better balancing of generation capacity and demand for electric power.

Abandonment of the EEC would not include the electric transmission facilities, which would be incorporated into other systems. There would be no adverse impact to electrical power transmission under abandonment.

4.17.2.3 Direct and Indirect Effects on Socioeconomics from Water Supply Facilities

Construction

Included in the Proposed Action is a water line from Lages Station south to the power plant. As with other components of the EEC, it would be necessary to purchase most of the construction materials from outside of the area. Engineers designing the water line provided estimates for local purchases and the cost of labor for the water line. Local purchases are primarily sand and gravel, ready-mix concrete, asphalt, local trucking and fuel. Since only the total cost of labor was provided, gross wages were estimated at 70 percent of the total cost of labor. The water line would be constructed in one season, and is currently slated for Year 3. Applying the RIMS II multipliers yields the results presented in **Table 4.17-14.**

Operations, Maintenance, and Abandonment

Water supply options for the EEC would have negligible effect on public water supply systems, since they would be separate systems. Use of community water systems by new, permanent residents would have a minor impact on those systems, should additional infrastructure be required. Ely and McGill community water systems have excess water rights and capacity to accommodate some new residents.

TABLE 4.17-14. ECONOMIC IMPACT OF WATER LINE FACILITIES CONSTRUCTION

	MULTIPLIER	YEAR 3
Cost of Labor, $		2,250,000
Gross Wages at 70 percent of Cost of Labor, $		1,575,000
Employment at $58,358 annually		27
Sand and Gravel, $		946,826
Ready-Mix-Concrete, $		5,781
Asphalt, $		7,800
Total Mineral Product Manufacturing, $		960,407
Employment	9.012	13.1
Earnings, $	0.3874	561,934
Local Trucking		315,515
Employment	18.5494	4.0
Earnings, $	0.4783	158,799
Fuels, $		444,150
Fuels at 33 percent trade margin, $		146,570
Employment	18.5494	2.5
Earnings, $	0.4783	70,104
Local Spending of Wages, 50% of wages	50%	787,500
Employment	7.3859	5.3
Earnings, $	0.2221	174,904
Total Indirect and Induced Employment		24.9
Total Indirect and Induced Earnings, $		965,741
Total Employment		51.9
Total Earnings, $		2,540,741

Source: Crispin and Isaacson 2008

Note: The Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the subject industry. The Employment Multiplier represents the total change in number of jobs that occurs in all industries for each additional $1 million of out output delivered to final demand by the subject industry. Because the Employment Multipliers are based on 2004 data, the output delivered should be in 2004 dollars.

4.17.2.4 Direct and Indirect Effects on Socioeconomics from Rail Facilities

Construction

In addition to the power plant itself, the Proposed Action would require establishing rail access to the power plant. The rail access would consist of constructing a new rail lead from the reconstructed NNRy to the plant site.

If the NNRy is not available, a new Alternative Rail Line would be constructed which would be roughly parallel to the NNRy and approximately 10 miles to the east. Construction of the Alternative Rail Line would impact Elko and White Pine counties, and would be over a shorter time-period than the full project, with the crews advancing along the lines as they are built.

The workers constructing the Alternative Rail Line would live in Ely or Wendover, and no housing would be provided by the company. Because the Alternative Rail Line would be approximately 100 miles long, workers would also live in various locations in both Elko and White Pine counties. The most likely locations would be Wendover, Utah; West Wendover, Nevada; Wells, Nevada; and Ely, Nevada. The rail line would be constructed over two years, Year 1 and Year 2, and have a project direct employment of 60 in Year 1 and 40 in Year 2. An estimated 25 percent of the workers employed constructing the rail line would be hired locally, so housing would be required to accommodate 45 visiting workers in Year 1 and 30 in Year 2 **(Table 4.17-15)**. As with the power plant itself, little of the material used to build the rail line could be sourced locally. Locally purchased materials would include gravel, concrete, asphalt, electric power, local trucking, gasoline and diesel fuel, and some building and office supplies.

Applying the appropriate multipliers from the RIMS II model to the predicted spending indicated that in Year 1, 51.5 jobs would occur as a result of indirect and induced impacts. In Year 2, there would be 24.5 jobs as a result of indirect and induced impacts. Annual estimated payroll for indirect and induced employment would be $2,006,000 for Year 1 and $916,796 for Year 2. For impacts as a result of household spending (i.e., personal spending by construction workers), it was assumed that all of the per diem and one-half of the wages would be spent locally. It is anticipated that most of the workers on the rail line would be hired by the contractors and live temporarily in either the Ely or Wendover areas.

TABLE 4.17-15. ECONOMIC IMPACT OF RAIL LINE CONSTRUCTION

	MULTIPLIER	YEAR 1	YEAR 2
Annual Average Direct Employment		60	40
Total Wages Direct Paid, $		3,600,000	2,400,000
Per Diem Paid, $		864,000	576,000
Indirect and Induced Employment			
Gravel		1,500,000	500,000
Ready-Mix-Concrete		50,000	10,000
Asphalt		60,000	120,000
Total Mineral Product Manufacturing		1,610,000	630,000
Employment	9.012	13.3	5.2
Earnings, $	0.3874	623,714	244,062
Electricity		9,600	9,600
Employment	3.7133	0.03	0.03
Earnings, $	0.2259	2,169	2,169
Gasoline, Diesel fuel, lubricants		180,000	120,000
Lumber, paint, other similar building supplies and tools		20,000	20,000
Office supplies,		4,000	4,000
Computer hardware and software		1,000	1,000
Other Miscellaneous retail purchases,		10,000	10,000
Total Retail		215,000	155,000

	MULTIPLIER	YEAR 1	YEAR 2
Retail at 33% trade margin	33%	70,950	51,150
Employment	18.5494	1.2	0.9
Earnings, $	0.4783	33,935	24,465
Local Trucking		1,500,000	500,000
Employment	13.7225	18.9	6.3
Earnings, $	0.5033	754,950	251,650
Local Spending of Wages, Per diem plus 50% of wages	50%	2,664,000	1,776,000
Employment	7.3859	18.07	12.05
Earnings, $	0.2221	591,674	394,450
Total Indirect and Induced Employment		51.5	24.5
Total Indirect and Induced Earnings, $		2,006,442	916,796
Total Employment		112	64
Total Earnings, $		5,606,442	3,316,795

Note: The Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the subject industry. The Employment Multiplier represents the total change in number of jobs that occurs in all industries for each additional $1 million of out output delivered to final demand by the subject industry. Because the Employment Multipliers are based on 2004 data, the output delivered should be in 2004 dollars.
Source: Crispin and Isaacson 2008

Operations, Maintenance, Abandonment

The operation of the historic NNRy or Alternative Rail Line would be essentially the same. Both would provide moderate, beneficial, long-term social and economic effects for historic communities along the rail line, for the town of Ely, Nevada, and for tourism in the region.

Rail line operations would require permanent employment of train crews and maintenance workers. The rail line operations and maintenance workers would be located at the EEC and would number approximately 34 persons. The indirect and induced impacts as a result of the rail line operations are local construction and earth moving companies used for track maintenance, local trucking companies, hardware and electrical items, and household spending by the local workers. Total indirect and induced employment as a result of rail line operations is estimated at 15.3 jobs with an annual payroll of $503,000 (**Table 4.17-16**).

TABLE 4.17-16. ECONOMIC IMPACT OF RAIL LINE OPERATION

	MULTIPLIER	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Annual Average Direct Employment		20	34	34	34	34	34
Total Direct Wages, $		1,248,500	2,102,000	2,102,000	2,102,000	2,102,000	2,102,000
Indirect and Induced Employment and Wages							
Gasoline, Diesel Fuel		100,000	100,000	100,000	100,000	100,000	100,000
Hardware, Electrical Parts, etc		20,000	20,000	20,000	20,000	20,000	20,000
Other Local Retail		40,000	40,000	40,000	40,000	40,000	40,000
Total Retail, $		160,000	160,000	160,000	160,000	160,000	160,000
Local Retail @ 33% trade margin	33%	52,800	52,800	52,800	52,800	52,800	52,800
Employment	18.5494	0.9	0.9	0.9	0.9	0.9	0.9
Earnings, $	0.4783	25,254	25,254	25,254	25,254	25,254	25,254
Local Construction Earthmoving, $		10,000	10,000	10,000	10,000	10,000	10,000
Employment	14.8278	0.1	0.1	0.1	0.1	0.1	0.1
Earnings, $	0.5851	5,851	5,851	5,851	5,851	5,851	5,851
Local Trucking, $		10,000	10,000	10,000	10,000	10,000	10,000
Employment	13.7225	0.1	0.1	0.1	0.1	0.1	0.1
Earnings, $	0.5033	5,033	5,033	5,033	5,033	5,033	5,033
Household Spending, $		1,248,500	2,102,000	2,102,000	2,102,222	2,102,222	2,102,000

	MULTIPLIER	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Employment	7.3859	8.4	14.2	14.2	14.2	14.2	14.2
Earnings, $	0.2221	277,292	466,854	466,854	466,854	466,854	466,854
Total Indirect and Induced Employment		9.6	15.3	15.3	15.3	15.3	15.3
Total Indirect and Induced Earnings, $		313,430	502,992	502,992	502,992	502,992	502,992
Total Employment		30	49.3	49.3	49.3	49.3	49.3
Total Earnings, $		1,561,930	2,604,992	2,604,992	2,604,992	2,604,992	2,604,992

Note: The Earnings Multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the subject industry. The Employment Multiplier represents the total change in number of jobs that occurs in all industries for each additional $1 million of out output delivered to final demand by the subject industry. Because the Employment Multipliers are based on 2004 data, the output delivered should be in 2004 dollars.
Source: Crispin and Isaacson 2008

4.17.2.5 Mitigation

1. The Proponents have entered into a cooperative agreement with White Pine County and other local community agencies to review potential adverse socioeconomic impacts to local community services and develop mutually agreeable approaches to mitigation of these impacts prior to the issuance of ROWs. These agreements on mitigation are outside the scope of this EIS, but could address the adverse impacts identified in this document when established. The County would coordinate with the BLM on these matters so the BLM becomes aware of the mitigation measures agreed to by the parties to the cooperative agreement.

2. The Proponents are to remove the worker village upon completion of construction to ensure that it does not create a housing surplus that would adversely affect the local housing market.

4.17.2.6 Unavoidable Adverse Impacts on Socioeconomics

There would be no residual adverse impacts to social and economic resources as a result of constructing and operating the EEC. The EEC would alter the economy of White Pine County. During the construction phase, there would be a temporary influx of construction workers. The impacts caused by this large increase in the population of White Pine County would subside once construction is complete and most of the construction workers leave White Pine County.

Once the EEC is operational, there would be a long-term increase in the workforce, income and population of White Pine County. This increase is due to the workforce needed to operate the power plant. Although there would be a permanent alteration in the local economy, this would help insulate the area from the cyclical nature of the metal mining industry which has been the economic history of the area.

4.17.2.7 Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, the social and economic structure of White Pine County would be altered. Once the power plant is operational, workforce, income and population of the area would be permanently increased due to the workforce necessary to operate the power plant. The industrial structure of the area would also be more diverse and the economy would be less dependent on metal mining.

4.17.2.8 Relationship of Short-term Uses and Long-term Productivity

Under the Proposed Action, the short-term uses of workforce and resources (during construction) provide for long-term economic benefits. The short-term uses do not interfere with the long-term economic and social stability of the area.

4.17.3 North Plant Site Alternative

The North Plant Site Alternative involves locating the power plant north of the Proposed Action in the north Steptoe Valley. This alternative requires fewer miles of rail line and additional construction of transmission line relative to the Proposed Action. The North Plant Site requires approximately 65 miles of rail line, instead of the 100 miles of rail line required under the proposed action. An additional 40 miles of transmission line would be required under this alternative. Impacts during the operations phase would be the same as for the Proposed Action. Detailed description of the North Plant Site and other alternative actions are found in **Chapter 2**.

4.17.3.1 Direct and Indirect Effects on Socioeconomics from Plant Site

The power plant itself would be essentially the same under both alternatives (see **Section 4.17.2**). It is anticipated that the North Plant Site would require some additional site preparation work, but the amount would be negligible when compared to the total cost of the power plant. (Crispin and Isaacson 2008)

Construction

Economic Setting

The overall effect on employment, property values, or other economic indicators in White Pine County would be similar to those under the Proposed Action. Since the North Plant Site has less nearby private land than the South Plant Site, there would be less adverse impacts to property values due to noise, altered views and similar changes.

Population and Demographics

The impact on population in the three-county area would be similar to the Proposed Action. Construction of the EEC at the North Plant Site would require approximately the same workforce as for the Proposed Action (see **Section 4.17.2**). It is noteworthy; however, that Wendover and Ely are approximately the same distance from the North Plant Site, making it likely that some construction and operations workers would commute from Wendover rather than Ely. This would represent a shift in the location of impacts but not a shift in the overall impact (i.e., number of workers, wages, etc).

Employment and Income

Under the North Plant Site Alternative, the greatest increase in employment is approximately 92 jobs in Year 3 with an increase of wages of $13 million (see **Table 4.17-17**).

TABLE 4.17-17. TOTAL EMPLOYMENT AND WAGES UNDER NORTH PLANT SITE ALTERNATIVE

YEAR	EMPLOYMENT	WAGES
Year 0	0	$0
Year 1	173	$8,892,000
Year 2	854	$52,183,000
Year 3	3,114	$236,060,000
Year 4	3,079	$230,132,000
Year 5	1,385	$92,759,000
Year 6	469	$35,515,000
Year 7	370	$25,343,000
Year 8	370	$25,343,000
Year 9	370	$25,343,000
Year 10	370	$25,343,000

Source: Crispin and Isaacson 2008

Land Ownership

Impacts would be the same as under the Proposed Action.

Agriculture

Impacts would be the same as under the Proposed Action.

Housing

A worker village would be a common feature in both the Proposed Action and the North Plant Site Alternatives. The North Plant Site associated worker village location farther to the north would make it less likely that construction workers would locate their residences in Ely and more likely they would live in the associated worker village. There would also likely be some commuting from Wendover.

Community Services

From the North Plant Site driving distance to Ely is very similar to the driving distance to West Wendover, Nevada and Wendover, Utah. Consequently, while the overall impacts to the area workforce, population and community services would be very similar between the North Plant Site and the Proposed Action, there would be some shift in the location of the impacts as some workers would commute from Wendover in addition to commuting from locations in White Pine County. The likely magnitude of that shift was not modeled and would be difficult to try to quantify with any certainty.

The overall impact on the local school systems would be equivalent under both the Proposed Action and the North Plant Site Alternative. Although equivalent, there would likely be a shift in demand on individual schools, depending on how many construction workers with families resided in White Pine County vs. Wendover. This would result in less pressure on the existing school infrastructure in White Pine County and add pressure in Wendover.

Overall impacts on law enforcement, fire and emergency response, health and social services, water supply, and solid waste management would be similar under both the Proposed Action and under this alternative. To the extent some construction workers would choose to live in Wendover, some of the impacts on these community services would be shifted from White Pine County communities to Wendover.

Local Government Finances

The fiscal impact on White Pine County governments would be essentially the same as the Proposed Action. The cost of the plant is similar under both scenarios so impacts on property taxes and sales taxes would be similar. These taxes would be collected in White Pine County although impacts to community services would be lessened by the relative number of construction workers who choose to commute from Wendover instead of White Pine County communities.

Operations, Maintenance, and Abandonment

Economic Setting

Once the EEC is operational, there would be no difference in the quantity of the impact on local employment, wages, local government revenues, property values or other economic indicators under the Proposed Action and the North Plant Site Alternative, since both alternatives require the same operational workforce.

Population and Demographics

Impacts would be the same as under the Proposed Action, with the same caveat regarding the likely shift in where operations personnel would live (Wendover vs. Ely) and consequent shift in impacts as noted under construction.

Employment and Income

Projected employment and wages under the North Plant Site Alternative would be the same as for the Proposed Action (see **Table 4.17-17**, and **Tables 4.17-2** and **4.17-3**). (Crispin and Isaacson 2008)

Land Ownership

Impacts would be the same as under the Proposed Action.

Agriculture

Impacts would be the same as under the Proposed Action.

Housing

Overall impacts would be the same as under the Proposed Action; however, since the North power plant is approximately equidistant between Ely and Wendover, impacts would be distributed between the two urban areas.

Community Services

Once the EEC is operational, there would be no difference in the impact on local school systems under the two alternatives. The locations of the impacts on the specific schools would be distributed between Ely and Wendover.

Impacts on law enforcement, fire and emergency response, health and social services, water supply, and solid waste management would be similar under both the Proposed Action and under this alternative.

Local Government Finances

Impacts would be the same as under the Proposed Action.

Electric Power Industry

Impacts would be the same as under the Proposed Action.

4.17.3.2 Direct and Indirect Effects on Socioeconomics from Electric Transmission Facilities

Construction

Impacts would be nearly the same as under the Proposed Action and negligible in the context of the total cost of the project. Under the North Plant Site Alternative, the additional transmission line would result in transmission line construction workers staying in the area for a longer period. However, this would be offset some by less impact from crews constructing the shorter rail line (Crispin and Isaacson 2008).

There would be additional demand for housing in White Pine County by the crews building the transmission line compared to the Proposed Action. As the additional 40 miles of transmission line would be constructed in White Pine County during Year 3 through Year 4 (see **Table 4.17-17**) there would be a net increase in employment and wages as compared to the Proposed Action (see **Tables 4.17-2** and **4.17-3**).

Operations, Maintenance, Abandonment

Impacts would be the same as under the Proposed Action.

4.17.3.3 Direct and Indirect Effects on Socioeconomics from Water Supply Facilities

Construction

Impacts would be the same as under the Proposed Action.

Operations, Maintenance, Abandonment

Impacts would be the same as under the Proposed Action.

4.17.3.4 Direct and Indirect Effects on Socioeconomics from Alternative Rail Line

Construction

The North Plant Site requires 65 miles of rail line instead of 100 miles as in the Proposed Action. The same amount of rail line would be built in Elko County as under the Proposed Action, so the demand for housing by rail construction workers in Elko County would be similar to that under the Proposed Action. Since, under the North Plant Site Alternative, there would be approximately 35 miles less rail line located in White Pine County, there would be a lower demand for housing by rail construction workers in White Pine County.

Under the North Plant Site Alternative, there is a slight decrease in wages and employment in Year 1 and Year 2, as a result of less rail line construction (see **Table 4.17-17** above). Difference in impacts from Proposed Action would be negligible in the context of the total project cost. Under the North Plant Site Alternative, the shorter rail line and additional transmission line would result in the transmission workers staying in Ely for a longer period. However, this would be offset some by less impact from the crews constructing the rail line (Crispin and Isaacson 2008).

Operations, Maintenance, Abandonment

Impacts would be the same as for the Proposed Action.

4.17.3.5 Mitigation

Mitigation for the North Plant Site alternative would be the same as for the Proposed Action.

4.17.3.6 Unavoidable Adverse Impacts on Socioeconomics

Unavoidable adverse impacts from the North Plant Site Alternative would be the same as for the Proposed Action.

4.17.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as for the Proposed Action.

4.17.3.8 Relationship of Short-term Uses and Long-term Productivity

Relationship of short- and long-term uses would be the same as for the Proposed Action.

4.17.4 No Action Alternative

Under the No Action Alternative, there would be no direct impact on the social and economic resources in Elko, Lincoln and White Pine Counties relative to current conditions. The economies of Elko, Lincoln, and White Pine counties would continue to be dependent primarily on mining, ranching and tourism and subject to the economic cycles of the mining industry.

4.18 Environmental Justice

4.18.1 Indicators and Methods

Areas of minority and/or low-income populations within the project area were reviewed for their potential to be burdened disproportionately by adverse impacts. Significant minority populations of Native Americans occur in Elko, Nye, and White Pine counties, and a significant population living at or below the poverty level occurs in Lincoln County.

4.18.2 Proposed Action: South Plant Site

4.18.2.1 Direct and Indirect Effects on Environmental Justice from Plant Site

Construction

The increased traffic, noise, and activity associated with construction of the Ely Energy Center and Mt. Wheeler Transmission Line would be focused at the construction site and the access routes for workers in Ely or McGill, and from the associated worker village to the project site. Although minority populations are present in the area, no minority populations were identified in the areas most likely to be directly impacted by the project. Low-income households comprise approximately 25 percent of households in White Pine County, including Ely, McGill, and rural areas. In general, the construction of the Ely Energy Center would have beneficial economic effects to communities in White Pine County. The construction workers village would not displace local residents and would mitigate housing needs. The construction activity itself would affect those in closest proximity to the South Plant Site, which includes residents of McGill. No minority populations were identified in the project area, and low-income households are present throughout the county but are not concentrated specifically in the project area. There are no special issues, such as housing, transportation access, or resource use in the project area that would affect an environmental justice population disproportionately. Income and revenue benefits from the project would be distributed widely, including potential environmental justice populations.

CEQ and EPA guidelines (CEQ 1997, EPA 1998a) recommend several specific tests to determine whether minority or low income populations would be disproportionately impacted by adverse project effect. The potential minority population of Native Americans, identified in Section 3.18, would not be disproportionally impacted for the following reasons:

- Geographically, no concentrated minority population (e.g., Goshute, Ely, Duckwater, South Fork (Odgers Ranch), Elko, Wells, and Duck Valley Indian Reservations) would be directly impacted (no project facilities on or through the reservation)
- Economically, overall impacts would be positive, not adverse
- Tribes have had, and continue to have, opportunity to participate in project discussions, through the public participation process, as a Cooperating Agency (Goshute Reservation), and in solicited requests (see **Sections 3.11** and **4.11**)
- Both the Human Health Risk Assessment and the Screening Level Ecological Risk Assessment (Tetra Tech 2008a, Tetra Tech 2008b) found that the EEC would not adversely affect any modeled receptors, including receptors at the Goshute, Ely and Odgers Ranch Reservations.

The population of poor in Lincoln County are not concentrated in any geographically identifiable area, and, as for minority populations, would not experience any disproportionate adverse effects from the project, during construction or operations. Overall, there would be negligible

disproportionate impacts on minority or low-income households from construction of the Proposed Action.

Operations, Maintenance, and Abandonment

Same as described for construction in the previous paragraphs, minority populations were identified in the project area but would not suffer and disproportionate adverse effects. Project features would be visible from US-93 (See **Section 4.15**), and from residences in the area. The power plant would not be visible from Ely. The Proposed Action would not cause disproportionate harmful pollutants or environmental risks to affect low-income or minority-based communities or residences. The Proposed Action would not adversely affect the ability of local agricultural operations to continue. There would be no disproportionate impacts to minority or low income populations from operation, maintenance, and abandonment of the EEC.

4.18.2.2 Direct and Indirect Effects on Environmental Justice from Electric Transmission Facilities

The transmission facilities would be predominantly in the SWIP Corridor. The SWIP Final EIS did not identify any disproportionately high or adverse impacts to minority or low- income populations (BLM 1993). New transmission lines constructed from the EEC to connect into the SWIP Corridor lines would be additional to and outside of the SWIP Corridor. Construction, operation, and abandonment of the Proposed Action transmission lines would have no disproportionate effects on minority or low income populations, same as for the Proposed Action.

4.18.2.3 Direct and Indirect Effects on Environmental Justice from Water Supply Facilities

The pipeline would be near the US-93 ROW. Construction, operation, maintenance, and abandonment of the pump stations, water wells on private land near Lages Station, and pipelines would not disproportionately displace or impact minority or low-income populations, same as for the Proposed Action.

4.18.2.4 Direct and Indirect Effects on Environmental Justice from Rail Facilities

Construction, operation and abandonment of the rail facilities would have negligible disproportionate impacts on minority or low-income communities or residences, same as for the Proposed Action.

4.18.2.5 Mitigation

No mitigation is required for the Proposed Action.

4.18.2.6 Unavoidable Adverse Impacts on Environmental Justice

There would be no unavoidable disproportionate impacts on minority or low-income populations.

4.18.3 North Plant Site Alternative

4.18.3.1 Direct and Indirect Effects on Environmental Justice from Plant Site

Impacts for construction, operation and eventual abandonment for the North Plant Site would be the same as those described for the Proposed Action.

4.18.3.2 Direct and Indirect Effects on Environmental Justice from Electric Transmission Facilities

Impacts for construction, operation and eventual abandonment of the alternative transmission facilities would be the same to those described for the Proposed Action.

4.18.3.3 Direct and Indirect Effects on Environmental Justice from Water Supply Facilities

Impacts for construction, operation and eventual abandonment of the alternative water supply facilities would be the same as those described for the Proposed Action.

4.18.3.4 Direct and Indirect Effects on Environmental Justice from Rail Facilities

Impacts for construction, operation and eventual abandonment of the rail facilities would be the same as those described for the Proposed Action.

4.18.3.5 Mitigation

No mitigation is required for the North Plant Site Alternative.

4.18.3.6 Unavoidable Adverse Impacts on Environmental Justice

There would be no unavoidable adverse impacts with regards to environmental justice concerns.

4.18.4 No Action Alternative

There would be no impacts to environmental justice under the No Action alternative.

4.19 Hazardous Materials and Solid Waste

4.19.1 Indicators and Methods

The following indicators were considered when analyzing potential impacts to resources from hazardous materials and solid waste:

- Tons per year or pounds per year of hazardous air emissions, hazardous wastes, and by-products
- Amount and type of hazardous materials transported and stored at the project facilities
- Location and type of waste disposal sites/systems, and
- Existing risk assessments of effects of hazardous compounds.

4.19.2 Proposed Action: South Plant Site

4.19.2.1 Direct and Indirect Effects of Hazardous Materials from Plant Site

Construction

Solid wastes that would be generated and managed during construction of the EEC would include construction debris, municipal solid waste (MSW), workforce sewage, non-hazardous hydrocarbon and antifreeze waste, and hazardous waste.

<u>Hazardous Materials</u>

Hazardous materials would be used during construction of the EEC (**Table 4.19-1**). The largest quantities of these materials would be diesel fuel, gasoline, and propane for on-site vehicles and space heating. Compressed gas cylinders would be used for welding, cutting, and other metal work during construction. New construction requires a large variety of commercial chemical products for cleaning, joining with adhesives, painting, and other coatings. Many of these products contain flammable or toxic chemicals.

TABLE 4.19-1. HAZARDOUS MATERIALS USED DURING EEC CONSTRUCTION

MATERIAL	USE
Diesel Fuel	Heavy equipment, trucks, and light vehicles
Gasoline	Trucks, light vehicles, power tools
Propane	Auxiliary generators, space heating
Compressed Gas	Welding, cutting, and other metal work
Certain paint, solvents, adhesives, coatings	Cleaning and protecting surfaces

All hazardous materials used in construction would be shipped to the EEC in trucks. All hazardous materials would be handled in compliance with applicable federal, state, and local requirements for shipping, packaging, documenting, containing, labeling, and disposal of spilled or unused quantities. Spills would be managed in compliance with manufacturers' instructions and NDOT guidelines. Liquid hazardous materials would be stored on-site within secondary containment systems to prevent releases of such materials to the environment in the event of a spill. Spilled chemicals would be contained and promptly cleaned up and the spill residues would be recycled on-site or packaged for recycling or disposal off site at permitted facilities. Hazardous materials managed this way, in full compliance with applicable regulations and manufacturers' recommendations, would cause negligible impacts to environmental resources on-site or during transportation.

Construction Debris, Scrap, and General MSW

Quantities of wood, paper, and plastic debris would be generated during construction, mostly from used packaging and empty containers but from other sources as well. This would be contained in bins on-site and shipped off site to a permitted landfill or equivalent for disposal. Quantities of scrap generated during construction would be stored on-site and occasionally recycled off site. General MSW, such as office and lunchroom wastes, would be collected and contained on-site in bins and other containers. It would be shipped off site to a permitted Class I landfill or equivalent for disposal.

Septic Waste

During construction the on-site workers would use portable sanitary facilities and temporary sanitary facilities (holding tanks) for collection of sewage that would be collected by contractors and shipped off-site for treatment and disposal. Sanitary sewage managed this way, in full compliance with applicable state regulations, would cause negligible impacts to environmental resources on-site.

Hydrocarbons and Antifreeze

During construction, large numbers of heavy equipment, trucks, and light vehicles would be used on-site. The heavy equipment would be maintained and fueled on-site as would some trucks and light vehicles. This would require installation of temporary tanks and containers for storage of diesel fuel, gasoline, lubricating oil, grease, and antifreeze. These tanks and containers would be designed and maintained to be leak free, but would also be installed within secondary containment systems designed to prevent the release of these materials into the environment in the event of a spill. Spill Prevention, Control and Countermeasure (SPCC) requirements would be complied with for these installations to minimize the potential for spills (see hydrocarbons discussion below for Operations, Maintenance, and Abandonment for more detailed explanation of SPCC requirements). Used oil, antifreeze and grease would also be managed in tanks and containers for recycling or disposal off-site in permitted facilities.

Nevada regulations require immediate notification to the NDEP of releases of greater than 25 gallons of petroleum product, or where greater than 3 cubic yards of soil are affected, or where

groundwater may be impacted. Other spill reporting to the EPA or National Response Center is specified in 40 CFR 112 and 40 CFR 302, respectively.

Hydrocarbons and antifreeze managed this way, in full compliance with applicable federal and state regulations, would cause negligible impacts to environmental resources on-site.

Hazardous Waste

Certain commercial products such as paints, thinners, solvents, adhesives, industrial coatings, spray aerosol cans, industrial lamps, and electronic components can contain chemicals that are listed as hazardous wastes or exhibit a hazardous waste characteristic. When these materials are no longer usable and need to be disposed, they can be regulated as hazardous wastes under federal and state requirements. Other media contaminated with certain hazardous wastes such as rags, wipers, adsorbents, used blasting grit, and used oil can also be regulated as hazardous wastes. All of these wastes could be generated on-site during construction in monthly quantities that would likely qualify each contractor generating them as an exempt small quantity generator.

The Proponent would require via contract that all hazardous wastes produced during construction be properly identified, contained, labeled, managed, and disposed of by the various construction contractors. Contract administrators and inspectors would ensure that hazardous wastes are properly managed and disposed of off-site in permitted treatment, storage, and disposal facilities. Hazardous wastes managed this way, in full compliance with applicable regulations, would cause negligible impacts to environmental resources on-site or during transportation.

Wastes produced during construction of the EEC plant would be managed in compliance with state and federal regulations and recycled or disposed of in existing, permitted facilities. These management practices would therefore produce negligible, short-term adverse environmental impacts.

Operations, Maintenance, and Abandonment

Hazardous Materials

The EEC would use a variety of reagents, hydrocarbons, and commercial chemical products that are considered to be hazardous materials by federal DOT regulations. The list of these materials is shown in **Table 4.19-2**.

TABLE 4.19-2. HAZARDOUS MATERIALS USED DURING EEC OPERATIONS

MATERIAL	USE
Sulfuric Acid	Cooling water treatment, condensate polishing, instrument batteries, deionizer regenerant
Sodium Hypochlorite	Water treatment
Bromide Solution	Cooling water treatment
Anti-scalant Solution	Cooling water treatment, wastewater treatment
Biocide Solution	Cooling water treatment
Sodium Hydroxide	Deionizer regenerant, condensate polishing
Oxygen Scavenger	Condensate polishing
Amine	Condensate polishing
Anhydrous Ammonia	Flue gas emission control
Diesel Fuel	Locomotive refueling, boiler starter fuel, auxiliary generators, coal handling equipment, ash haul trucks, light vehicles, fire water pumps
Gasoline	Ash haul trucks, light vehicles, power tools
Propane	Auxiliary generators, communications towers
Compressed Gas	Maintenance, generators, calibration gas
Certain Maintenance Products	Paint, solvents, cleaners, janitorial

Other bulk chemicals that would be used but are not hazardous materials would include: hydrated lime, soda ash, coagulant (for water clarification), limestone, and activated carbon.

Most reagents and commercial chemical products would be shipped to the EEC in trucks. Certain bulk commodities like diesel fuel, limestone, sulfuric acid, anhydrous ammonia, and possibly other materials would more likely be shipped to the facility in rail cars, but could also be shipped in trucks.

All reagents, hydrocarbons, and commercial chemical products would be handled in compliance with applicable federal, state, and local requirements for shipping, packaging, documenting, containing, labeling, and disposal of spilled or unused quantities. Spills would be managed in compliance with manufacturers' instructions and NDOT guidelines. Liquid hazardous materials would be stored on-site within secondary containment to prevent releases of such materials to the environment in the event of a spill. Spilled chemicals would be contained and promptly cleaned up and the spill residues would be recycled on-site or packaged for recycling or disposal off-site at permitted facilities. Hazardous materials managed this way, in full compliance with applicable regulations and manufacturers' recommendations, would cause negligible impacts to environmental resources on-site or during transportation.

<u>CCBs and Pond/Basin Sediments</u>

The largest solid waste stream produced at the plant would be coal combustion byproducts (CCB), which would include fly ash and bottom ash from the boilers, synthetic gypsum from the air pollution control system, solids from on-site wastewater holding ponds, and site wastewater that is mixed with the ash for compaction and dust control. At least 1,550,000 tons of CCB would be produced annually but the actual rate would vary depending on the coal quality and plant output. A coal ash analysis for Powder River Basin Coal is shown in **Table 4.19-3**. Actual coal ash chemistry for the EEC may be different than that shown depending on the source(s) of coal being used at any one time. Synthetic gypsum produced in the scrubbers would consist of up to 90 percent hydrated calcium sulfate (gypsum), less than 10 percent inert material and fly ash, and less than 2 percent of other materials such as calcium sulfite, chloride, and soluble salts. The actual chemistry of the CCB disposed in the on-site landfill would vary with the chemistry and relative quantity of ash, gypsum, pond solids, and plant wastewater included in the mixture of CCB being handled at any one time.

TABLE 4.19-3. COAL ASH ANALYSIS

CHEMICAL	CONCENTRATION (WT %)
Aluminum oxide (Al_2O_3)	17.11
Calcium oxide (CaO)	26.67
Iron oxide (Fe_2O_3)	6.07
Magnesium oxide (MgO)	5.30
Phosphorous pentoxide (P_2O_5)	0.97
Potassium oxide (K_2O)	2.87
Silica (SiO_2)	35.51
Sodium oxide (Na_2O)	1.68
Sulfur trioxide (SO_3)	1.36
Titanium dioxide (TiO_2)	1.26
Other	1.0

Source: CUE Cost Input Data Ely Energy Center – BACT Analysis

CCBs produced at the plant can potentially be recycled off site. Fly ash and bottom ash could be used as fill in road construction and fly ash could be used as an additive in concrete. Synthetic gypsum could be used for wallboard manufacturing. The Proponent would pursue off-site use of CCBs as potential opportunities arise. These materials would be shipped via covered

truck or rail cars. These recycled CCBs would be valuable byproducts used off site and would not be disposed of as solid wastes on-site in the landfill.

In 1993, the EPA made a final regulatory determination that CCBs are exempt from regulation as a hazardous waste under Subtitle C of the Resource Conservation and Recovery Act (RCRA). In its regulatory determination, EPA concluded that the state industrial solid waste management programs implemented under Subtitle D or RCRA were adequate regulatory controls for managing the disposal of CCBs. The regulations governing solid waste disposal in Nevada include NAC 444.570 through 444.7499 and permits are required for landfills used to manage CCBs under the requirements for Class III landfills (NAC 444.733). Class III landfills must meet location and siting criteria of the regulations and be permitted through the Nevada Bureau of Waste Management (NBWM). Permit applications must include a design report, environmental monitoring plan, operational plan, closure/post closure plan, financial assurance, and a waste characterization plan. The NBWM reviews permit applications for Class III landfills for compliance with applicable requirements and issues a notice of intent to approve or deny the application subject to a 30-day public comment period.

To comply with the NBWM regulations for containment of industrial wastes in Class III landfills, the CCB landfill at the EEC would be designed to prevent the infiltration of leachate to groundwater through use of a plastic membrane liner and leachate collection system. Water collected in the leachate collection system would drain by gravity to a detention basin. The leachate detention basin would also be lined with a plastic membrane and sized to collect the predicted quantity of leachate plus storm water runoff from the landfill area draining to the basin during the 24-hour, 100-year storm.

Runoff from precipitation falling on the limestone/gypsum/ash areas would be gravity drained to a dedicated decant basin and wastewater collection and transfer system to prevent infiltration of this water to underlying groundwater and to remove suspended sediment. Runoff from precipitation falling on the active landfill cells would be collected and gravity drained to a dedicated, lined evaporation basin designed to prevent release of the runoff to surface waters or groundwater.

CCBs disposed of on-site would be dewatered at the plant to a moist solid consistency and trucked to the active area of the landfill with on-site access roads and ramps. Dust from the trucks would be controlled by maintaining the moisture content of the CCBs before being loaded in the trucks. Dust from the haul roads to the landfill would be controlled with water or other dust control measures. Dust from the active and exposed landfill surfaces would be controlled with applied water.

The total landfill area would be approximately 1,000 acres in size but not all of this area would be actively used to manage CCBs at any one time. Placement of CCBs in the landfill would occur in smaller "cells" that would be built sequentially over the life of the facility. CCBs would be hauled to the active cells with trucks, spread with a dozer, moistened with water, and compacted. When an active cell is filled to final grade it would be covered with a layer of clean earth obtained from on-site stockpiles. The final earth surface would be reclaimed with vegetation to stabilize the surface from erosion.

Other, inert solid wastes would be generated during plant operations from occasional removal of sediment from on-site ponds and basin. This sediment would consist primarily of: natural dirt and dust collected in the ponds; scale and sediment from treatment of raw water, cooling tower and scrubber blowdown; fine particles of limestone, ash and gypsum; and *de minimis* amounts of spilled commercial products collected in plant sumps along with water. This sediment would

occasionally be cleaned out of the basins and ponds, dewatered, and placed on the CCB landfill.

Through the management measures described above, disposal of solid wastes in the CCB landfill is expected to result in negligible environmental impacts to surface water, groundwater, air resources, and human health.

General Municipal Solid Waste

MSW would be collected and contained in on-site bins and other containers. It would be transported off-site by the EEC or a contractor approved by the receiving landfill authority to a permitted Class I landfill or equivalent for disposal.

Septic Waste

During operations, the EEC would generate sewage from sinks, toilets and lavatories in various buildings. The sewage handling facilities would be designed for up to 250 full-time workers anticipated for both Phase 1 and 2 operations along with an estimated 50 contract employees. Sewage generated from the permanent operations would be treated in an on-site package treatment plant. Treated effluent from this plant would be disposed of in an on-site subsurface fluid distribution system and leach lines. During operational maintenance projects and modifications to off-site areas, the workforce would use temporary sanitary facilities provided and maintained by a contractor. Sludge from the package treatment plant would be periodically collected and disposed as a non-hazardous solid waste in a permitted, off-site treatment/disposal facility.

Nevada regulations require a permit be issued by the NDEP to construct a sewage treatment plant. Treatment of wastewater and disposal of wastewater underground is regulated by NAC 445A.810 through 445A.925. These apply to treatment of sewage and discharge of treated effluent via a septic system or package treatment plant. Disposal of treated effluent underground would require a Groundwater Discharge Permit issued by the NDEP under NAC 445A.228. The permit application would require a demonstration that groundwater quality would not be degraded by the operation of the proposed facilities.

Through the management measures described above, disposal of sanitary sewage in the proposed facilities is expected to result in negligible environmental impacts to surface water, groundwater, or human health.

Hydrocarbons and Antifreeze

The EEC would store approximately 2.5 million gallons of diesel fuel in approximately 11 locations at the plant site with the largest portion being used for secondary boiler fuel and fuel for locomotives and heavy equipment working in the coal yard. Other liquid hydrocarbons used at the plant would include hydraulic oils, lubricating oils, and greases that are used in stationary plant equipment and in mobile equipment. Diesel fuel would be consumed with little waste other than oil filter media and small amounts of contaminated absorbents from cleanups of drips and small spills. Hydraulic oils, lubricating oils, and greases would be contained within the equipment using them but would occasionally be replaced during maintenance which would also generate used filter media and contaminated rags and adsorbents. Also used would be coolant/anti-freeze that would be changed out during maintenance activities. All hydrocarbons and antifreeze would be managed in tanks, totes, drums or other containers designed and maintained to prevent spills and releases. Underground storage tanks would not be used.

The Federal Oil Pollution Prevention Regulation (40 CFR 112) requires a SPCC Plan for any facility that stores more than 1,320 gallons of oil in aboveground tanks or more than 42,000 gallons of oil in underground tanks. Compliance with this rule is intended to contain oil spills and prevent them from contaminating surface waters and groundwater. The EEC would prepare an SPCC Plan that would include the following:

- Facility diagram
- Facility drainage and spill movement predictions
- Descriptions of tanks and containers
- Secondary containment descriptions
- Spill contingency plans
- Inspection, testing and recordation methods
- Personnel training procedures
- Site security measures
- Tank car and truck unloading procedures
- Transfer operations and pumping

All tanks and containers of liquid hydrocarbons and antifreeze at the facility would be constructed and maintained to be leak proof and would be provided with secondary containment that would prevent the release of the hydrocarbons to the environmental in the event of a spill. Nevada regulations require immediate notification to the NDEP of releases of greater than 25 gallons of petroleum product, where greater than 3 cubic yards of soil are affected, or where groundwater may be impacted. Other spill reporting to the EPA or National Response Center is specified in 40 CFR 112 and 40 CFR 302, respectively.

Hydrocarbons and antifreeze managed this way, in full compliance with applicable federal and state regulations, would cause negligible impacts to environmental resources on-site.

<u>Hazardous Waste</u>

The EEC would use hazardous materials and would generate both RCRA hazardous waste and Nevada Special Wastes. The facility would usually generate hazardous wastes at the Small Quantity Generator level but would occasionally generate at the Large Quantity Generator (LQG) level, and would be regulated at that time as an LQG. Quantities of hazardous wastes produced and disposed of would be minimized through careful selection of materials and recycling to the extent feasible. The typical hazardous and special wastes generated at the EEC would include:

- Spent solvents and paint-related materials
- Spent aerosol cans
- Cloth wipers and rags contaminated with solvents
- Universal wastes (batteries, industrial lamps)
- Acid wastes
- Electronic wastes
- Miscellaneous small quantities of new or used chemical products

Hazardous wastes would be collected, contained, labeled and documented in compliance with federal RCRA and Nevada regulations. Containers of liquid hazardous wastes would be managed in secondary containment to prevent releases to the environment in the event of a spill. Hazardous wastes would not be disposed of on-site but would be transported off-site to permitted transportation, storage, disposal, and recycling facilities. Hazardous wastes managed this way, in full compliance with applicable regulations, would cause negligible impacts to environmental resources on-site.

<u>Abandonment</u>

At the end of the useful life of the EEC facilities, operations would be terminated in an organized manner that would result in proper final cleanup of wastes requiring off-site disposal and closure of the on-site waste management facilities in compliance with the closure and final reclamation requirements of the state permits. Permits issued by the state for operation of the CCB landfill, various ponds, and the sewage treatment facilities would all include requirements for final closure in accordance with approved plans.

The final disposal cell of the CCB landfill would be closed according to plans including placement of the final earth cover followed by revegetation of that cover. Monitoring of the final cover, leachate collection systems, and groundwater monitoring wells would continue for a number of years following final closure in compliance with the permit terms.

The various collection, storage, and evaporation ponds would be closed according to their permits issued by the state. Final quantities of sediment and sludge in the ponds would be removed and placed in the CCB landfill prior to it being closed. Ponds no longer needed for control of runoff long-term would be regraded, covered with a final earth layer and revegetated.

The package treatment plant of the sewage treatment system would be cleaned out and dismantled. The sanitary disposal system would then be closed in accordance with the permits issued by the state. Sewer lines and other buried features would be left in place but surface features related to manholes, sumps, and cleanouts would be removed to eliminate any surface expression.

Prior to demolition activities all unused products and chemicals in storage on-site would be repackaged and shipped off-site for recycling or disposal in permitted facilities. Process equipment and sumps would be drained and rinsed of all oils, chemicals, and commercial chemical products, which would be collected and shipped off-site for recycling or disposal in permitted facilities.

Recyclable scrap metal, wood, masonry, pavement, and building materials would be collected during demolition and shipped off site for recycling. All other demolition debris would be collected and shipped off site to an existing permitted landfill.

Wastes produced during operation, maintenance, and abandonment of the EEC plant would be managed in compliance with state and federal regulations and recycled or disposed of in existing, permitted facilities. These management practices would therefore produce negligible environmental impacts.

4.19.2.2 Direct and Indirect Effects of Hazardous Materials from Electric Transmission Facilities

Construction

Solid waste streams generated during construction of the electric transmission facilities, including substations, would include MSW, sewage, construction debris, non-hazardous regulated wastes, and small quantities of hazardous wastes. MSW from the workforce would be collected, contained and trucked to an off-site permitted Class I landfill or equivalent. Sewage would be collected in portable sanitary facilities and removed by a contractor for off-site treatment and disposal in an existing permitted treatment facility.

Non-hazardous construction debris would be generated during construction consisting of concrete, wood, scrap metal, and waste packaging materials. These materials would be recycled or disposed of off-site in a permitted landfill.

Hydrocarbon or hazardous wastes may be generated from maintenance of heavy equipment in the field. These wastes would include used oil and grease, antifreeze, solvents, rags, and wipers. These wastes would be properly contained, labeled, and recycled or disposed of off-site in existing permitted facilities.

Wastes produced during construction would be managed in compliance with state and federal regulations and recycled or disposed of in existing, permitted facilities. These management practices would therefore produce negligible environmental impacts.

Operations, Maintenance, and Abandonment

Operation of the transmission lines and substations would utilize little in the way of hazardous materials and would generate only minor amounts of MSW, which would be brought back to the service center for disposal. Transformer oils would be used in closed transformers and certain other electrical devices. These are highly refined petroleum oils with low vapor pressure, high flash point, and low toxicity. In normal use, they are fully contained within the electrical apparatus which themselves would be located in secure, fenced facilities. These management practices would therefore produce negligible environmental impacts.

4.19.2.3 Direct and Indirect Effects of Hazardous Materials from Water Supply Facilities

Construction

Solid waste streams generated during construction of the water supply wells and pipelines would include MSW, sewage, construction debris, non-hazardous regulated wastes, and small quantities of hazardous wastes. MSW from the workforce would be collected, contained and trucked to an off-site permitted Class I landfill or equivalent. Sewage would be collected in portable sanitary facilities and removed by a contractor for off-site treatment and disposal in an existing permitted treatment facility.

Non-hazardous construction debris would be generated during construction consisting of drilling mud, cement, wood, scrap metal, and scrap plastic. These materials would be recycled or disposed of off-site in an existing permitted landfill.

Hydrocarbon or hazardous wastes may be generated from maintenance of heavy equipment in the field. These wastes would include used oil and grease, antifreeze, solvents, rags and wipers. These wastes would be properly contained, labeled, and recycled or disposed of off-site in existing permitted facilities.

Wastes produced during construction would be managed in compliance with state and federal regulations and recycled or disposed of in existing, permitted facilities. These management practices would therefore produce negligible environmental impacts.

Operations, Maintenance, and Abandonment

Operation of the water supply facilities would utilize little in the way of hazardous materials and would generate only minor amounts of MSW, which would be brought back to the EEC for disposal. Petroleum lubricating oils and greases would be used for pumps installed within the water supply system and would be contained within this equipment. These management practices would therefore produce negligible, long-term adverse environmental impacts.

4.19.2.4 Direct and Indirect Effects of Hazardous Materials from Rail Facilities

Construction

Solid waste streams generated during construction of the rail lead from the NNRy to the South Plant Site or the Alternative Rail Line would include MSW, sewage, construction debris, non-hazardous regulated wastes, and small quantities of hazardous wastes. MSW from the workforce would be collected, contained and trucked by an approved contractor to an off-site permitted Class I landfill or equivalent. Sewage would be collected in portable sanitary facilities and removed by a contractor for off-site treatment and disposal in an existing permitted treatment facility.

Non-hazardous construction waste would be generated during construction consisting of broken or rejected ties, steel rails, other scrap and general debris. These materials would be transported by an approved contractor to be recycled or disposed of off-site in an existing permitted landfill.

Hydrocarbon or hazardous wastes may be generated from maintenance of heavy equipment in the field. These wastes would include used oil and grease, antifreeze, solvents, rags and wipers. These wastes would be properly contained, labeled, and recycled or disposed of off-site in existing permitted facilities.

Wastes produced during construction would be managed in compliance with state and federal regulations and recycled or disposed of in existing, permitted facilities. These management practices would therefore produce negligible environmental impacts.

Operations, Maintenance, and Abandonment

During operations, railroad equipment would be maintained in facilities located at the EEC plant site. The waste streams related to these activities were described in the plant site evaluation.

There is a potential for spills of materials along the rail line during operations. For the period 1971-1991, the national rate of reported hazardous materials spills for railroads was 0.0056 incidents per mile per year (Cutter & Ji 1997), and Nevada had the ninth lowest number of reported spills by railroads among the states. Hydrocarbon spills could occur from the locomotives and maintenance equipment. These would be reported to the state per applicable regulations and petroleum contaminated ballast and soil would be cleaned up. In the unlikely event of an accident along the railroad there could be a spill of freight including coal, propane, ammonia, fuel oil, sulfuric acid, caustic soda, limestone, or other bulk commodities used at the EEC. Any such spills would be immediately responded to in order to contain and clean up the spilled materials along with any contaminated soil. Reports would be made as per federal and state regulations to the Local Emergency Planning Committee, NDEP, and federal agencies as required for a particular release. Affected areas would likely be contained within the ROW for the railroad and would not impact environmental resources outside of this area. Due to the

remoteness of the railroad, human populations would not likely be affected by spills along the ROW.

These management practices would therefore produce negligible environmental impacts.

4.19.2.5 Mitigation

Additional mitigation measures are not required.

4.19.2.6 Unavoidable Adverse Impacts due to Hazardous Materials and Solid Wastes

Wastes produced by the Proposed Action and Action Alternatives would be managed according to all applicable regulations in permitted waste management facilities to minimize environmental impacts. These wastes would contribute to the environmental impacts allowed by the waste management facility permits.

4.19.2.7 Irreversible and Irretrievable Commitments of Resources

Wastes produced during construction and operation of the facilities would be disposed of off-site in existing permitted facilities and would permanently consume some of the waste storage capacity at those facilities. CCB wastes produced in the operation would be permanently stored on-site in the CCB landfill.

4.19.2.8 Relationship of Short-term Uses and Long-term Productivity

The use of hazardous materials and generation of solid and hazardous wastes in the construction of the Proposed Action and the alternatives (short-term) would consume some capacity, but not significantly impact the productivity of off-site waste management facilities in the long-term.

4.19.3 North Plant Site Alternative

4.19.3.1 Direct and Indirect Effects of Hazardous Materials from Plant Site

The types of wastes managed and the applicable management practices applied during construction, operation, maintenance, and abandonment of the North Plant Site would also be practiced in essentially the same manner as the Proposed Action, South Plant Site. The environmental impacts of these practices at the North Plant Site would therefore be the same as the Proposed Action.

4.19.3.2 Direct and Indirect Effects of Hazardous Materials from Electric Transmission Facilities

The types of wastes managed and the applicable management practices applied during construction, operation, maintenance and abandonment of the North Plant Site electric transmission facilities and alternatives would also be practiced in essentially the same manner as the Proposed Action transmission lines. The environmental impacts of these practices for the North Plant Site electric transmission facilities would therefore be the same as the Proposed Action.

4.19.3.3 Direct and Indirect Effects of Hazardous Materials from Water Supply Facilities

The types of wastes managed and the applicable management practices applied during construction, operation, maintenance, and abandonment of the North Plant Site water supply facilities and alternatives would also be practiced in essentially the same manner as the

Proposed Action water supply facilities. The environmental impacts of these practices for the North Plant Site water supply facilities would therefore be the same as the Proposed Action.

4.19.3.4 Direct and Indirect Effects of Hazardous Materials from Rail Facilities

The types of wastes managed and the applicable management practices applied during construction, operation, maintenance, and abandonment of the North Plant Site rail facilities would also be practiced in essentially the same manner as the Proposed Action rail facilities. The environmental impacts of these practices for the North Plant Site rail facilities would therefore be the same as the Proposed Action.

4.19.3.5 Mitigation

Additional mitigation measures are not required.

4.19.3.6 Unavoidable Adverse Impacts due to Hazardous Materials

Unavoidable adverse impacts due to hazardous materials would be the same as described for the Proposed Action.

4.19.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action.

4.19.3.8 Relationship of Short-term Uses and Long-term Productivity

Relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.19.4 No Action Alternative

The No Action Alternative would result in the Proposed Action not being constructed or operated so hazardous materials would not be utilized in the project and solid or hazardous wastes would not be generated.

4.20 Transportation

4.20.1 Indicators and Methods

The analysis of impacts to transportation is based on existing access in the area, project requirements, and a project-specific transportation study (HDR et al. 2007). The following indicators were considered when analyzing potential impacts to transportation.

- Current capacity and condition of road system
- Traffic volume
- Projected number of project-related heavy vehicles utilizing roadway
- Weather related visibility and road conditions (see **Section 4.6**)
- Projected number of project-related vehicles carrying hazardous substances (see **Section 4.19**)
- Changes in existing primary access on public roads through the area
- Number of fragmented grazing allotments and livestock corridors (see **Section 4.9**)
- Number of fragmented wildlife corridors (see **Section 4.8**)

- Project elements and heights that would occur in standard arrival/departure flight paths

4.20.2 Proposed Action: South Plant Site

4.20.2.1 Direct and Indirect Effects on Transportation from Plant Site

Construction

Construction of the power plant would take approximately 60 months. The South Plant Site would connect to the Nevada roadway system using two entrances from US-93. An encroachment permit would be required to access and upgrade US-93. Generally, one of these entrances would be designated for truck use, while the other would be designated for passenger vehicle use. Both driveway locations have the potential of being utilized during construction, however it is intended that one driveway be temporarily closed upon completion of Phase I. This driveway would then only be utilized when maintenance activities require two driveway locations.

The following general assumptions about travel patterns related to the construction and operation of the plant were used in determining impacts (HDR et. al 2007):

- Shift work would be expected during construction and operation
- Occasional periods of 6-day work-weeks
- There would be 1.75 to 1.85 persons per vehicle
- One staff/vendor for every 10 craft laborers

Construction activities at the power plant site would increase the annual average daily traffic (AADT) on US-93, the main access route to the South Plant Site. Construction traffic volumes would be higher than those during operation of the EEC and were therefore used as the controlling volumes for analysis (HDR et al. 2007). Given the current traffic volumes and a projected 3 percent growth rate, future traffic projections are provided in **Table 4.20-1**.

TABLE 4.20-1. FUTURE TRAFFIC VOLUMES ON PROJECT AREA ROADS

	US-93, 0.5 MILES NORTH OF MCGILL	US-93, 0.4 MILES SOUTH OF MCGILL	CHERRY CREEK ROAD, 0.2 MILES WEST OF US-93	DUCK CREEK ROAD
YEAR	AADT	AADT	AADT	AADT
Base Year 2005	1,600	2,950	60	130
2010	1,855	3,420	70	151
2015	2,150	3,965	81	175
2020	2,493	4,596	93	203
2025	2,890	5,328	108	235
2030	3,350	6,177	126	272

Source: HDR et al. 2007

Assuming that local labor (i.e., White Pine County residents) would come from the residential areas located to the south of the plant site (McGill and Ely areas), it is estimated that 150 to 250 construction workers would commute to the site from this area. This would comprise about 5 percent of the construction workforce. During construction, most workers would be housed at the associated worker village located approximately 4 miles north of the South Plant Site along US-93. Therefore the majority of construction worker traffic would come from the north.

Heavy truck traffic would consist of equipment and materials delivery for construction. Several assumptions were made in order to estimate construction vehicle volumes (HDR et al. 2007):

- All aggregates, crushed stone, and asphalt would be delivered by truck.
- Seventy-five percent of the trucks delivering aggregates, crushed stone, and asphalt would be freeway doubles, and the remaining 25 percent would be standard five-axle single trailer dumps.
- Heavy haul is any payload item weighing more than 100,000 lbs.
- All construction equipment would be delivered by truck.
- The generator stators and rotors would be delivered by rail.
- Fifty percent of other heavy haul items would be delivered by rail.
- Distribution of loads between truck and rail would be by judgment.
- Truck deliveries listed in Standard & Permit column (Table 4.20-2) includes overwidth vehicles and payloads up to 100,000 lbs.
- Average rail car load for other than heavy haul items is equivalent to three standard trailer lots.

TABLE 4.20-2. ESTIMATED TRUCK VOLUMES*

CATEGORY	TRUCK DELIVERIES		RAIL DELIVERIES		
	STD & PERMIT	HEAVY HAUL	EQUIV. LOTS	RAIL CAR	HEAVY HAUL
Aggregates, crushed rock, clay, and asphalt	18,400				
Construction Equipment	1,400				
Steam Generator	1,100		1,100	337	2
Steam turbine	20	2	20	7	6
AQCS equipment	130		130	43	
BOP equipment and commodities	6,200	14	800	270	14
Daily/mixed lot deliveries	4,800				
Total	**32,050**	**16**		**660**	**22**

*provided by Cummins and Barnard in HDR et al. 2007

Although it is likely that truck traffic would enter the power plant site from one driveway and passenger vehicles would enter from the other, traffic volumes for both driveways were combined to provide the maximum volume scenario. The number of passenger cars per day and the number of truck deliveries per day were calculated and the construction traffic was added to the existing background US-93 traffic (HDR et al. 2007) and presented in **Table 4.20-3.**

TABLE 4.20-3. ESTIMATED WORKERS AND VEHICLES PER DAY

MONTH	PHASE I LABOR	PHASE II LABOR	TOTAL LABOR	STAFF/ VENDOR	TOTAL	VEHICLES	TRUCK DELIV.	TOTAL VOLUME	AADT
1	70		70	7	77	44	26	70	
2	90		90	9	99	57	26	82	
3	90		90	9	99	57	26	82	
4	200		200	20	220	126	26	151	96
5	200		200	20	220	126	26	151	
6	300		300	30	330	189	26	214	
7	400		400	40	440	251	26	277	
8	700		700	70	770	440	26	466	
9	800		800	80	880	503	26	528	
10	800		800	80	880	503	26	528	
11	900		900	90	990	566	26	591	
12	800		800	80	880	503	26	528	
13	700		700	70	770	440	26	466	

MONTH	PHASE I LABOR	PHASE II LABOR	TOTAL LABOR	STAFF/ VENDOR	TOTAL	VEHICLES	TRUCK DELIV.	TOTAL VOLUME	AADT
14	500		500	50	550	314	26	340	
15	500		500	50	550	314	26	340	
16	900		900	90	990	566	26	591	418
17	1,500		1,500	150	1,650	943	26	968	
18	1,600	50	1,650	165	1,815	1,037	26	1,063	
19	1,900	90	1,990	199	2,189	1,251	26	1,276	
20	2,200	90	2,290	229	2,519	1,439	26	1,465	
21	1,700	200	1,900	190	2,090	1,194	26	1,220	
22	2,000	200	2,200	220	2,420	1,383	26	1,408	
23	2,000	200	2,200	220	2,420	1,383	26	1,408	
24	1,800	300	2,100	210	2,310	1,320	26	1,346	
25	1,900	600	2,500	250	**2,750**	1,571	26	1,597	
26	1,500	500	2,000	200	2,200	1,257	26	1,283	
27	1,300	500	1,800	180	1,980	1,131	26	1,157	
28	1,300	500	1,800	180	1,980	1,131	26	1,157	1,279
29	1,200	500	1,700	170	1,870	1,069	26	1,094	
30	1,100	500	1,600	160	1,760	1,006	26	1,031	
31	1,000	600	1,600	160	1,760	1,006	26	1,031	
32	1,100	600	1,700	170	1,870	1,069	26	1,094	
33	900	900	1,800	180	1,980	1,131	26	1,157	
34	600	1500	2,100	210	2,310	1,320	26	1,346	
35	200	1500	1,700	170	1,870	1,069	26	1,094	
36	200	1500	1,700	170	1,870	1,069	26	1,094	
37	200	1800	2,000	200	2,200	1,257	26	1,283	
38	90	1,100	1,190	119	1,309	748	26	774	
39	90	1,300	1,390	139	1,529	874	26	899	
40	90	1,300	1,390	139	1,529	874	26	899	1066
41	30	1,200	1,230	123	1,353	773	26	799	
42		1,300	1,300	130	1,430	817	26	843	
43		1,500	1,500	150	1,650	943	26	968	
44		1,200	1,200	120	1,320	754	26	780	
45		1,200	1,200	120	1,320	754	26	780	
46		1,100	1,100	110	1,210	691	26	717	
47		1,100	1,100	110	1,210	691	26	717	
48		800	800	80	880	503	26	528	
49		900	900	90	990	566	26	591	
50		500	500	50	550	314	26	340	
51		400	400	40	440	251	26	277	
52		200	200	20	220	126	26	151	624
53		200	200	20	220	126	26	151	
54		200	200	20	220	126	26	151	
55		90	90	9	99	57	26	82	
56		90	90	9	99	57	26	82	
57		90	90	9	99	57	26	82	
58		20	20	2	22	13	26	38	98

AADT – Annual Average Daily Traffic volumes
Source: HDR et al. 2007

For purposes of the traffic analysis, it was assumed there would be a workforce peak of approximately 2,750 persons and 1,579 vehicles during the 25th month of construction. Historic energy plant construction data (HDR et al. 2007) indicates the following project vehicle configurations:

- Construction traffic would be comprised of approximately 13 percent heavy vehicles on average (it would be expected to be much higher during periods of removal or replacement of roadway materials)
- 86 percent of traffic would be passenger vehicles
- 66 percent of construction traffic would enter the site during a single hour in the morning
- 66 percent of construction traffic would exit the site during a single hour in the evening
- There would be potential for the remaining 33 percent of construction traffic to enter the site during the same evening peak hour

Although there would be no significant operational deficiencies observed on US-93 with the addition of construction traffic, it appears there would be inadequate gaps in traffic to allow all of the left and right turning vehicles to enter and exit the EEC plant without excessive delay. Such gap inadequacy would result in long delays for vehicles entering and exiting the site at the beginning and end of each work shift. Due to high volumes of traffic during a single peak hour, a signal warrant analysis was performed for the driveway entrance. This analysis concluded that peak hourly volumes would exceed specified values causing undue delay in entering or crossing the major street during certain months of construction (HDR et al. 2007). An intersection signal would be warranted during certain months of construction (**Table 4.20-4**).

TABLE 4.20-4. SIGNAL WARRANTED

CONSTRUCTION PERIOD	INTERSECTION ANALYSIS
Months 1-7	No Signal Warranted
Months 8-13	Signal Warranted
Months 14-15	No Signal Warranted
Months 16-49	Signal Warranted
Months 50-58	No Signal Warranted

Due to fluctuation in workforce there would be a two-month period (**Table 4.20-4**, Months 14 and 15) when the signal is not warranted; however, due to safety concerns and continuity, the signal would remain in place.

Since the majority of the workers would be housed at the associated worker village to the north of the plant site, there should not be major delays at the intersection of Duck Creek Road and US-93. As noted above, some of the workers would come from the south, passing through McGill and by the Duck Creek intersection at the beginning and ending of each work shift. Increased traffic through McGill during commute hours could increase risk to residents and pedestrians on Main Street.

With the addition of the EEC traffic to the projected AADT, US-93 would remain at operational Level of Service (LOS) A (the highest level) with the addition of a traffic signal at the intersections with the plant site. The delay would be approximately 7.1 seconds per vehicle at the intersections (HDR et al. 2007). This continues to represent free flow of traffic with low volumes and high speed; therefore there would be no impact on traffic flow on US-93. The increase in traffic would require the addition of turn lanes and a signal; however this would not change the primary access on public roads through the area. Impacts to transportation from the construction of the power plant at the South Plant Site would be minor and temporary.

I-15, I-80, US-6, US-50, and SR-318 (U.S. and state highways) were designed to carry interstate traffic, including semi-trucks and trailers, and would be able to accommodate materials and equipment delivery.

Operations, Maintenance, and Abandonment

A direct workforce of about 150 full-time jobs would be present at the power plant after completion of Phase I. Additional off-site employment would be expected through "multiplier effect," wherein other employment opportunities would be created for EEC service and support functions in the local and regional economy. However, these worker numbers and associated traffic are much lower than the anticipated construction traffic volume and would not impact traffic flow on US-93.

An analysis was completed on how fog, humidity, and/or condensation, as result of operation of the EEC plant, would affect visibility and roadway conditions (see **Section 4.6**). Any potential impacts from operation of the power plant on visibility and roadway conditions would be mitigated through signing and/or Intelligent Traffic System devices.

Impacts to transportation from the operation and maintenance of the power plant at the South Plant Site would be minor and long-term.

The South Plant Site would be about 16 miles from the Yelland Field / Ely Airport. The power plant would not create a hazard to standard arrival/departure flight paths for Yelland Field / Ely Airport. The stack at the power plant would be 727 feet high, the tallest component of the plant. FAA regulations (49 CFR Section 77.23) define aviation obstructions as including structures greater than 500 feet high above ground level. The next tallest structure at the power plant would be the boiler at 280 feet, well below the 500-foot obstruction threshold. The stack at the power plant would constitute a minor long-term impact to air transportation.

4.20.2.2 Direct and Indirect Effects on Transportation from Electric Transmission Facilities

Construction

Construction of the electric transmission lines and facilities would take approximately 24 months. During peak construction periods for the first phase of work, approximately 500 workers would be employed. The peak construction period is expected to last about 18 months of the approximate 24-month transmission facility project. Access to the transmission ROWs would be from different areas as construction proceeds. Existing roads would be used to the extent possible with upgrading as required (grading and gravel) to allow passage of construction traffic. A permanent graveled access road would be constructed down the center line of the transmission line ROWs. Construction of the transmission lines would proceed rapidly down the ROWs so access roads servicing any one part of the ROWs would be used for construction for a few weeks or months before the construction moves far enough down the line that other access roads would be used. Transmission line installation is not expected to impact traffic flow along major roadways but would impact traffic on secondary roads used for access to the ROWs. There would be temporary and minor to moderate impacts on transportation during transmission line construction.

Operations, Maintenance, and Abandonment

Planned operations and maintenance on transmission lines would consist of an annual line patrol of two linemen by helicopter. It would probably take two days per year to patrol the proposed transmission lines. Any ground inspections would be conducted generally following the centerline travel route used for construction. This path would also be utilized for required maintenance or repair. Labor required would be 40 to 80 worker days every year.

Access to the Robinson Summit Substation would be from US-50 over an existing dirt road that would be widened and improved and then a new gravel road that would extend to the substation site. Access to the Harry Allen Substation would be from the existing access road. Planned

operations and maintenance on substations and switchyards would consist of annual inspections of all major equipment such as transformers, reactors, and breakers (operation verification, visual inspections, infrared inspections, etc.). More intensive inspections and tests would be conducted on major equipment every three to five years (oil samples, switch alignment, gas maintenance, and manufacturer scheduled maintenance). Based on the proposed project scope, workforce requirements could total 200 to 400 worker days per year.

The operation, maintenance, and abandonment of the electric transmission facilities would have a negligible impact on transportation.

The transmission towers would range in height from 100 to 185 feet, lower than the aviation obstruction guidelines. The transmission lines would all be farther than 3 miles from the Yelland Field / Ely Airport. The transmission lines would not create a hazard to standard arrival/departure flight paths for Yelland Field / Ely Airport. The microwave tower that would be constructed at the Robinson Summit Substation would be 100 feet high. The electric transmission facilities would not impact air transportation.

4.20.2.3 Direct and Indirect Effects on Transportation from Water Supply Facilities

Construction

It is estimated that approximately 27 to36 workers would be needed for construction of the water supply facilities. This would include two dirt crews (four to five people per crew) and two pipe crews (about six to eight people per crew). There may also be two to three engineers on-site, as well as security, traffic control crews (five to seven people), and trucking crews. Access to pipeline ROWs would be from different areas as construction proceeds down the lines. Existing roads would be used to the extent possible with upgrading as required (grading and gravel) to allow passage of construction traffic. Existing secondary roads crossed by pipeline construction would be closed for short periods of time to allow installation of the pipeline and then would be rebuilt over the pipeline. Installation of a water supply pipeline should not impact highway traffic as highways would be bored under. Construction at well fields and along the pipeline would add vehicles to local roadways. This would be a temporary and negligible impact to transportation.

Operations, Maintenance, and Abandonment

There would be a need for weekly inspections of the pumping stations and well pumps. The pipeline ROW would receive monthly visual inspections. The number of workers required for water facilities maintenance would be part of the overall plant site staff. This would be a long-term negligible impact to transportation.

Water supply facilities would be at ground or below ground levels and would not impact air transportation.

4.20.2.4 Direct and Indirect Effects on Transportation from Rail Facilities

Construction

Alternative Rail Line

As many as 60 workers would be utilized during construction of the Alternative Rail Line. These would likely be spread out into two or more crews. Access to the rail line would be from different areas as construction proceeds along the line. Existing roads would be used for access to the extent possible with upgrading as required (grading and gravel) to allow passage of construction traffic. Existing secondary roads crossed by the rail line would be detoured for short periods of time to allow construction to proceed over the road and then the road would be re-established over the rail line. Each such grade crossing for a lightly traveled secondary road would be

protected with standard railroad crossing signs. This would be a temporary minor to moderate impact on transportation.

All road-rail grade crossings would be constructed in such a way as to maintain the existing roadway surface. This would be done in accordance with a permit from NDOT. The zone immediately over the track structure (estimated total width of 10 feet) would be improved with crossing surface material. All work would be done to maintain vehicular traffic on frequently used roads or under an approved traffic control plan from the roadway authority. All public at-grade crossings would be reviewed by NDOT and the Public Utilities Commission of Nevada to determine the appropriate type of warning devices that would be installed. At a minimum, each passive crossing would have a "Railroad Crossing" (or Crossbuck) sign, as required, and a "Yield" sign, as recommended by FHWA under the 2003 *Manual on Uniform Traffic Control Devices*. It is anticipated that the US-93 crossing at Currie would be detoured immediately to the north on a temporary bypass. At the US-93 crossing it is likely that traffic would warrant the inclusion of train-activated automatic flashing light signals or automatic flashing light signals with roadway gates; these would be installed as part of the project and maintained by the operator of the rail line. Impacts to highway transportation from railroad crossing construction would be moderate and temporary.

<u>*South Plant Site Rail Lead*</u>

Construction of the South Plant Site Rail Lead would be much smaller in scale compared to the Alternative Rail Line, with only 1.5 miles of lead needed from the existing NNRy to the South Plant Site. It would not cross any roads or require any detours.

Operations, Maintenance, and Abandonment

<u>*Alternative Rail Line*</u>

Operations and maintenance work crews of six or fewer employees (e.g., one track inspector, three-man maintenance crew, and one signal maintainer) would be expected to work along the rail line at any given time. At the plant site, as many as 20 railroad workers per shift may be on-site performing inspections, servicing locomotives and rail cars, and maintaining rail and rail related facilities. There are likely to be two to three 8-hour shifts working 7 days per week at the plant site. This would be a long-term negligible impact to transportation.

Traffic on the rail line itself would be limited to train traffic for deliveries to the plant site and occasional vehicular traffic to inspect and maintain the rail lead. Maximum operating speed for trains is currently planned for 49 mph; however, loaded coal trains would be limited to a maximum speed of 45 mph. Assuming normal operations, coal unit trains are anticipated to be 135 cars (nominal) long with future expansion to 150-car trains. Coal delivery to the power plant translates to 427, 135-car incoming trains or 384, 150-car incoming trains each year. The same number of empty outgoing trains would travel on the rail line for a total number of three to five trains per day on average passing any one road crossing. Impacts to road traffic at each road-rail grade crossing would be long-term and minor.

At the end of the power plant's life, the Alternative Rail Line and lead could still provide value to the power plant site for a future industrial use if maintenance were consistent. The rail line could provide beneficial, minor, and long-term impact to area transportation.

The Alternative Rail Line would be at ground level and would not impact air transportation.

NNRy

Operations and maintenance would be similar to the Alternative Rail Line discussed above (**Section 4.20.2.4**). The NNRy would have additional local commercial traffic in addition to the trains for the EEC. The NNRy would be at ground level and would not impact air transportation.

It is not anticipated that the NNRy would be abandoned when plant operations cease. The rehabilitated NNRy line would continue to experience use due to local commercial and industrial interests. The rail line would be a beneficial, moderate, and long-term impact on the area.

South Plant Site Rail Lead

The rail lead operations and maintenance would be in conjunction with the NNRy. This lead could still provide value to the power plant site for a future industrial use if maintenance were consistent.

4.20.2.5 Mitigation

1. The Proponents are to coordinate with NDOT and utilize proper signage and Intelligent Traffic System devices to avoid potential impacts to visibility and roadway conditions due to operation of the EEC plant.

4.20.2.6 Unavoidable Adverse Impacts on Transportation

There would be no unavoidable adverse impacts on transportation. Improvements made to existing public access routes during project activities would remain after the life of the project.

4.20.2.7 Irreversible and Irretrievable Commitments of Resources

Any changes made during project construction, operation, or maintenance to existing public roads would constitute irretrievable commitments for these roadways. There would be no irreversible impacts to transportation from the project.

4.20.2.8 Relationship of Short-term Uses and Long-term Productivity

The local short-term use of the project area would result in employment and other economic benefits to the local and regional economies. Local public access routes in the project area affected by the project would be restored to conditions equal to or better than existed before the project.

4.20.3 North Plant Site Alternative

4.20.3.1 Direct and Indirect Effects on Transportation from Power Plant Site

Construction

The impacts to transportation along US-93 would be similar to those described under the South Plant Site (**Section 4.20.2**). However, Wendover is not much further in distance than Ely from the North Plant Site, making it likely that some construction workers would commute from Wendover rather than Ely. This would represent a shift in the location of transportation impacts but not a shift in the overall impact. Impacts would be minor and temporary.

Over the last ten years, Cherry Creek Road has experienced little to no significant increase in traffic. If the North Plant Site were constructed, a significant increase in traffic along this roadway is expected (HDR et al. 2007). See **Table 4.20-1** for projected volumes.

During construction, the majority of workers would be housed at the associated worker village located approximately 9 miles north of the North Plant Site along US-93. As discussed in **Section 4.20.2.1**, the majority of construction worker traffic would come from the north, with a

small amount of traffic coming from the south. This site would be over 30 miles further from the nearest towns of Ely and McGill and would be a longer commute for those workers living in those communities.

The impacts to air transportation would be similar to those described under the South Plant Site alternative (**Section 4.20.2**). The distance of the North Plant Site from Yelland Field/Ely Airport would be greater, at about 47 miles.

Operations, Maintenance, and Abandonment

Impacts would be similar to those described for the Proposed Action. However, Wendover is not much further in distance than Ely from the North Plant Site, making it likely that some operations workers would commute from Wendover rather than Ely. This would represent a shift in the location of transportation impacts but not a shift in the overall impact

4.20.3.2 Direct and Indirect Effects on Transportation from Electric Transmission Facilities

Construction

Impacts would be the same as those described for the Proposed Action.

Operations, Maintenance, and Abandonment

Impacts would be the same as those described for the Proposed Action.

4.20.3.3 Direct and Indirect Effects on Transportation from Water Supply Facilities

Construction

Impacts would be the same as those described for the Proposed Action.

Operations, Maintenance, and Abandonment

Impacts would be the same as those described for the Proposed Action.

4.20.3.4 Direct and Indirect Effects on Transportation from Rail Facilities

Construction

Impacts would be the same as those described for the Proposed Action.

Operations, Maintenance, and Abandonment

Alternative Rail Line

Impacts would be similar to those described for the Proposed Action.

NNRy

Impacts would be the same as those described for the Proposed Action.

North Plant Site Rail Lead

The rail lead operations and maintenance would be in conjunction with the NNRy. This lead could still provide value to the power plant site for a future industrial use if maintenance were consistent.

4.20.3.5 Mitigation

Traffic mitigation measures would be the same as those described for the Proposed Action.

4.20.3.6 Unavoidable Adverse Impacts on Transportation

There would be no unavoidable adverse impacts on transportation. Improvements made to existing public access routes during project activities would remain after the life of the project.

4.20.3.7 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as for the Proposed Action.

4.20.3.8 Relationship of Short-term Uses and Long-term Productivity

The local short-term use of the project area would result in employment and other economic benefits to the local and regional economies. Local public access routes in the Project Area affected by the project would be restored to conditions equal to or better than existed before the project.

4.20.4 No Action Alternative

Under the No Action Alternative, the EEC project and associated facilities would not be constructed. There would be no impacts from the project to existing traffic or the transportation system.

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Cumulative Effects

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Cumulative Effects

5.1 Introduction

Cumulative effects are those impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions on the Cumulative Effects Areas (CEAs). They can result from individually minor, but collectively significant actions taken over a period of time. Major past and present land uses and disturbances in the area, which are also projected to continue into the future, include: roads, wildfires, livestock grazing, agriculture, and mining. Dispersed recreation (including hunting and fishing) and residential development also occur in parts of the CEAs.

The CEAs for this EIS vary by resource. The configuration of the Proposed Action and Action Alternatives, as well as public scoping input gathered for this EIS, provided the foundation for identifying CEAs. Cumulative effects should be evaluated in terms of the specific resource, ecosystem, and human community being impacted, and therefore, the boundaries of the CEAs vary by resource. An attempt was made for each environmental resource to determine the extent to which the environmental effect could be reasonably detected and then include the geographic areas of resources that could be impacted by the environmental effect. However, for simplicity, ease of cumulative impact analysis, and in an attempt to avoid having only slightly different CEAs for a number of resources, CEA boundaries were left identical for multiple resources where it seemed reasonable and conservative to do so. The CEA boundaries are reasonably sized to prevent dilution of the cumulative effects over large areas. Guidance from the Council on Environmental Quality (CEQ), "Considering Cumulative Effects – January 1997," was used in identifying geographic boundaries and ultimately the CEA for each resource. The CEA for each environmental resource – and the rationale for its boundaries – is described below in each specific resource subsection. Maps for the various CEAs are also included.

Table 5.1-1 details the land ownership by CEA. The information in this table will be referred to throughout the discussions by resource topic in the proceeding sections.

Table 5.1-2 details the existing quantifiable land uses within each CEA that will be discussed by resource topic in the proceeding sections.

Table 5.1-3 details the future quantifiable land uses within each CEA that will be discussed by resource topic in the proceeding sections. Detailed descriptions of most of the projects are provided in **Section 5.2**. Projects that are not discussed in **Section 5.2** are detailed under the resource topic for which they are evaluated.

Because the primary cause of impacts to groundwater would be due to pumping and use rather than surface disturbance, the groundwater CEA is not included in **Tables 5.1-1, 5.1-2,** or **5.1-3**.

The cumulative effects of the air quality impacts from the EEC were modeled at different scales for the Class I and Class II areas. Plus there were additional evaluations for impacts from permitted air emissions sources that were not modeled. Because of these complexities, the air quality CEA is not included in **Tables 5.1-1, 5.1-2** or **5.1-3**.

TABLE 5.1-1. LAND OWNERSHIP BY CEA

LAND OWNERSHIP	SURFACE WATER, SOILS, VEGETATION, WETLANDS, FISH & AQUATICS, CULTURAL RESOURCES, NATIVE AMERICAN CONCERNS, VISUAL, AND NOISE CEA		GEOLOGY, MINERALS, TOPOGRAPHY, AND PALEONTOLOGICAL RESOURCES CEA		WILDLIFE AND SPECIAL STATUS SPECIES CEA		RANGE RESOURCES CEA		LAND USE CEA*		SPECIAL DESIGNATIONS** AND RECREATION CEA		SOCIOECONOMICS CEA	
	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA
Bankhead-Jones	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,300	0.01>	3,303	0.01	3,303	0.01
Bureau of Land Management	1,741,392	87.40	1,442,572	85.9	1,902,275	77.84	5,231,520	93.54	24,500,901	66.82	17,313,010	72.50	23,421,370	67.00
Bureau of Indian Affairs	4,883	0.25	4,883	0.29	169,429	6.93	6,073	0.11	296,837	0.81	148,786	0.62	148,786	0.43
Bureau of Reclamation	N/A	N/A	N/A	N/A	N/A	N/A	627	0.01	29,053	0.08	36,383	0.15	N/A	N/A
Department of Defense	N/A	N/A	N/A	N/A	N/A	N/A	2	0.01>	2,654,243	7.24	1,187,291	4.97	2,645,066	7.57
Department of Energy	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	863,004	2.35	1,388	0.01>	863,004	2.47
National Park Service	N/A	N/A	N/A	N/A	NA	NA	N/A	N/A	440,624	1.20	398,116	1.67	183,998	0.53
U.S. Fish & Wildlife Service	69,486	3.49	69,486	4.14	68,968	2.82	27,350	0.49	322,251	0.88	791,084	3.31	279,110	0,80
U.S. Forest Service	62,458	3.13	62,458	3.72	169,429	6.93	437	0.01	3,893,558	10.62	1,708,757	7.16	3,918,368	11.21
Total Federal	**1,878,219**	**94.3**	**1,579,399**	**94.05**	**2,310,101**	**94.53**	**5,266,009**	**94.15**	**33,003,771**	**90.02**	**21,588,118**	**90.40**	**31,463,005**	**90.00**
Open Water	2,257	0.11	2,257	0.13	2,255	0.09	4,857	0.09	94,373	0.26	143,117	0.60	49,396	0.14
Private	111,157	5.58	97,001	5.78	130,743	5.35	312,008	5.58	3,500,542	9.55	2,082,412	8.72	3,415,096	9.77
State of Nevada	700	0.04	700	0.04	693	0.03	10,042	0.18	65,996	0.18	67,951	0.28	31,982	0.09
Total All Owners	**1,992,334**	**100.0**	**1,679,357**	**100.0**	**2,279,168**	**100.0**	**5,592,916**	**100.0**	**36,664,682***	**100.0**	**23,881,598****	**100.0**	**34,959,479**	**100.0**

Source: BLM\bnd_landownership_2006_Sept_poly updated with the new Ely Shoshone file
*There are discrepancies among the shape files for land use, therefore the total acreage for the CEA is slightly less than actual.
**The CEA for Special Designations extends into the State of Utah as the CEA includes lands within a 50-mile radius of project components. However, data in this table is only available for the State of Nevada. Therefore, acreages and percentages are slightly less than actual for the CEA.

TABLE 5.1-2. EXISTING QUANTIFIABLE LAND USES BY CEA

LAND USE DISTURBANCES	SURFACE WATER, SOILS, VEGETATION, WETLANDS, FISH & AQUATICS, CULTURAL RESOURCES, NATIVE AMERICAN CONCERNS, VISUAL, AND NOISE		GEOLOGY, MINERALS, TOPOGRAPHY, AND PALEONTO-LOGICAL RESOURCES		WILDLIFE AND SPECIAL STATUS SPECIES		RANGE RESOURCES		LAND USE		SPECIAL DESIGNATIONS AND RECREATION		SOURCES
	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	
Mining (active & abandoned)	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	N/A
Mine tailings (KCC-McGill tailings)	3,700 acres	0.19	3,700 acres	0.23	3,700 acres	0.16	3,700 acres	0.07	3,700 acres	0.07	3,700 acres	0.07	KCC Undated
Gravel Pits (active & abandoned)	565 acres	0.03	554 acres	0.03	714 acres	0.03	581 acres	0.01	1,157 acres	0.01>	1,157 acres	0.01>	Source: unknown File Name: gravelpits_poly
Burned Areas	86,734 acres	4.35	84,861 acres	5.20	94,267 acres	4.14	255,480 acres	4.57	3,317,873 acres	9.05	1,272,193 acres	5.33	Source: BLM, File Names: 1999, 2000, 2001, 2002, 2003, 2005t, 2006, & 2007
Roads – Interstate and Primary U.S.	2,170 acres 179 linear miles	0.11	2,024 acres 167 linear miles	0.12	2,085 acres 172 linear miles	0.09	2,115 acres 349 linear miles	0.04	7,503 acres 1,238 linear miles	0.02	7,436 acres 1,227 linear miles	0.03	Source: http://sagemap.wr.usgs.gov/datalist_thm.asp 100 foot right-of-way assumed to calculate acreage from linear miles
Roads – Secondary State Highway	121 acres 10 linear miles	0.01	121 acres 10 linear miles	0.01	121 acres 10 linear miles	0.01	533 acres 88 linear miles	0.01	6,485 acres 1,070 linear miles	0.02	4,255 acres 702 linear miles	0.02	
Roads – Local, neighborhood, rural, city	16,539 acres 2,729 linear miles	0.83	13,921 acres 2,297 linear miles	0.85	19,903 acres 3,284 linear miles	0.87	45,824 acres 7,561 linear miles	0.82	258,533 acres 42,658 linear miles	0.71	204,097 acres 33,676 linear miles	0.85	Source: http://sagemap.wr.usgs.gov/datalist_thm.asp 50 foot right-of-way assumed to calculate acreage from linear miles
Vehicular Trail – passable by 4WD only	978 acres 538 linear miles	0.05	778 acres 428 linear miles	0.05	1,136 acres 625 linear miles	0.05	3,055 acres 1,680 linear miles	0.05	14,909 acres 8,200 linear miles	0.04	11,725 acres 6449 linear miles	0.05	Source: http://sagemap.wr.usgs.gov/datalist_thm.asp 15 foot right-of-way assumed to calculate acreage from linear miles
Grazing Lands	1,803,850 acres	90.54	1,458,199 acres	89.32	2,071,704 acres	90.90	5,231,957 acres	93.55	28,394,459 acres	77.44	19,021,767	79.65	Assumed to include BLM and USFS lands
Irrigated Agriculture	4,036 acres	0.20	N/A	N/A	4,658 acres	0.20	8,182 acres	0.15	N/A	N/A	N/A	N/A	Source: BLM File Name: nv04 ReGap.mdb
Utility ROWs	5,418 acres 447 linear miles	0.27	5,273 acres 435 linear miles	0.32	5636 acres 465 miles	0.25	7,636 acres 630 linear miles	0.14	26,303 acres 2,170 linear miles	0.07	25,224 acres 2,081 linear miles	0.11	Source: http://sagemap.wr.usgs.gov/datalist_thm.asp 100 foot right-of-way assumed to calculate acreage from linear miles
Urban (medium-high density)	121 acres	0.01	N/A	N/A	123 acres	0.01	2,625 acres	0.05	N/A	N/A	N/A	N/A	Source: BLM File Name: nv04 ReGap.mdb

Acreages are not necessarily exclusive and may overlap

TABLE 5.1-3. POTENTIAL QUANTIFIABLE PERMANENT DISTURBANCE (IN ACRES) FROM REASONABLY FORESEEABLE PROJECTS

PROPOSED PROJECT DISTURBANCES	SURFACE WATER, SOILS, VEGETATION, WETLANDS, FISH & AQUATICS, CULTURAL RESOURCES, NATIVE AMERICAN CONCERNS, VISUAL, AND NOISE	GEOLOGY, MINERALS, TOPOGRAPHY, AND PALEONTO-LOGICAL RESOURCES	WILDLIFE AND SPECIAL STATUS SPECIES	RANGE RESOURCES	LAND USE	SPECIAL DESIGNATIONS AND RECREATION
Spruce Mountain Restoration Project	16,000	N/A	16,000	16,000	16,000	N/A
Ely Airport Expansion	1,545	N/A	1,545	N/A	1,545	N/A
Coyote Springs Community Development	43,000	43,000	43,000	N/A	43,000	43,000
Hidden Valley Community Development						914
Apex Industrial Park	6,000	N/A	6,000	N/A	6,000	6,000
Northern Nevada Railroad reconstruction	2,600	N/A	2,600	2,600	2,600	N/A
Yucca Mountain Geologic Repository railroad	600	N/A	600	3,252	600	N/A
Nevada Wind Company Wind Farms	4,470	N/A	4.470	N/A	4,470	4,470
Enexco Wind Farm	4,536	N/A	4,536	N/A	4,536	4,536
White Pine Energy Station	1,510	1,510	1,510	1,510	1,510	1,510
Ely Energy Center (EEC)	7,070	7,070	7,070	7,070	7,070	7,070
Totals	**87,331**	**51,580**	**87,331**	**30,432**	**88,331**	**67,500**

N/A: Information not quantifiable, the project does not fall within the CEA, or would not impact the resource.

Note: Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time but would contribute additional future disturbance.

5.2 Water Resources

5.2.1 CEA Boundary

Surface Water Resources - The CEA for surface water resources includes the Steptoe Valley hydrologic basin area from Duck Creek north to the divide with Northern Butte Valley and Goshute Valley, along with a 2.5-mile buffer either side of the linear facilities consisting of: 1) the Alternative Rail Line/water line alignment, and 2) the SWIP Corridor, including the transmission line alternatives (**Figure 5.2-1**). The total area of this CEA is 1,992,334 acres.

Groundwater Resources – The CEA for groundwater resources includes the Steptoe Valley hydrologic basin area from approximately Hercules Gap north to the divide with Northern Butte Valley and Goshute Valley (**Figure 5.2-2**). The total area of this CEA is 878,597 acres.

Wetlands – The CEA for wetlands would be the same as that described for surface water (**Figure 5.2-1**).

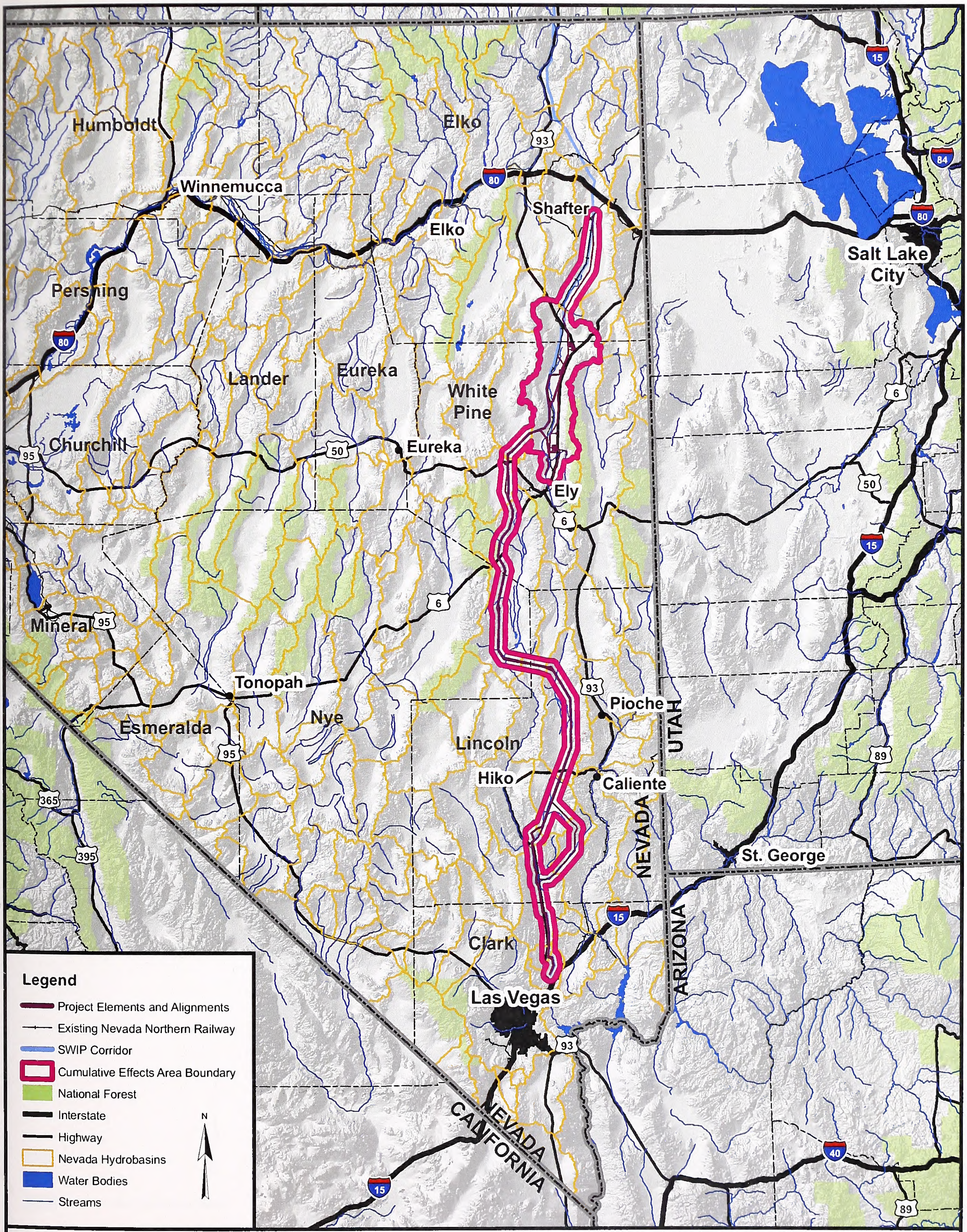
Rationale

Surface Water Resources - The direct and indirect effects of the Proposed Action and Action Alternatives on flow and quality of surface streams is confined to the Duck Creek watershed from the Duck Creek impoundment downstream to Goshute Lake. All other components of the project are designed to have no or minimal effects on surface streams outside of their direct disturbance areas, which are confined within the larger boundaries along the linear facilities.

Note that impacts of air emissions on surface water and other surface resources are considered within the larger CEA of the Air Quality resource section.

Groundwater Resources – Groundwater in the project area that would be affected by the direct and indirect impacts from the Proposed Action and Action Alternatives is contained within the alluvial fill of this hydrologic basin. This aquifer is contained within the hydrologic basin separated from surrounding basins by topographic and hydrologic divides with minimal movement of groundwater across these divides, compared to the overall water balance within the basin. In addition, the groundwater resources within this hydrologic basin are regulated by the State Engineer separately from surrounding basins. While there is consideration of water movement between the valley fill aquifer and the underlying volcanic rock aquifer, and of movement between hydrologic basins within the carbonate aquifer underlying the volcanic rock aquifer, this movement is not well-understood and is within the margin of error inherent in water balance calculations (Welch and Bright 2007).

Wetlands – Wetlands are supported by surface water and near-surface ground water. The CEA incorporates natural watershed boundaries including all past, present, and reasonably foreseeable disturbances in the Duck Creek watershed downstream of the Duck Creek Impoundment. Wetland resources in the electric transmission facilities ROWs would be avoided by design (**Section 4.2.3.2**). Impacts by the project on wetlands should not be noticeable beyond the CEA area.



Source - Base Map: ESRI and National Atlas of the United States

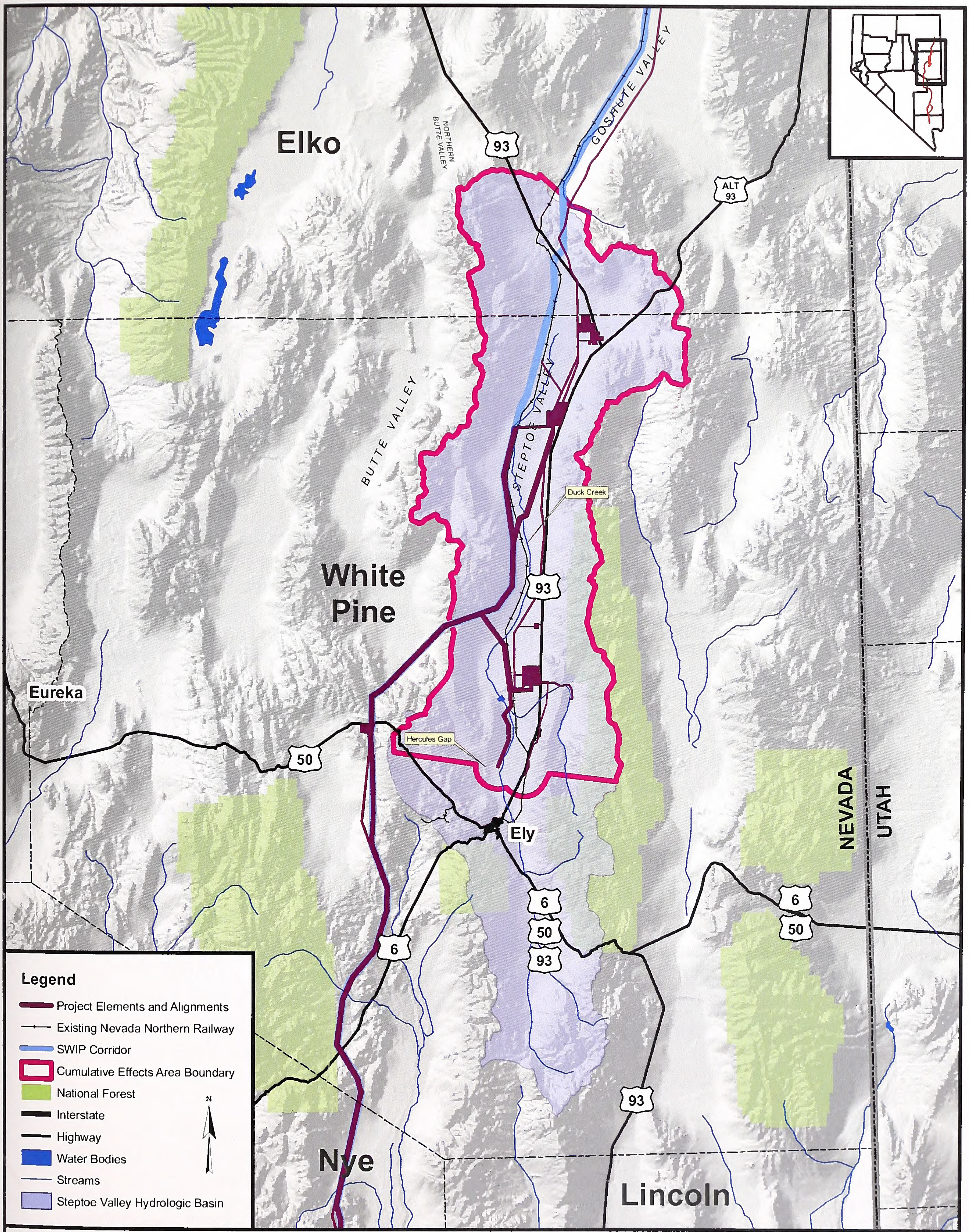
1:3,400,000

40 0 40 Miles

60 0 60 Kilometers

Scale is 1:3,400,000 when printed at 8.5"x11"

FIGURE 5.2-1
CUMULATIVE EFFECTS AREA FOR SURFACE WATER, SOIL, VEGETATION, WETLANDS, FISHERIES AND AQUATICS, RECREATION, CULTURAL RESOURCES, VISUAL/AESTHETHICS, AND NOISE RESOURCES
ELY ENERGY CENTER



Source - Base Map: ESRI and National Atlas of the United States

1:1,000,000

10 0 10 Miles

20 0 20 Kilometers

Scale is 1:1,000,000 when printed at 8.5"x11"

FIGURE 5.2-2
CUMULATIVE EFFECTS AREA
GROUND WATER RESOURCES
ELY ENERGY CENTER

5.2.2 Introduction

Water Rights

Water physically available for use in any water basin is the difference between the water coming into the basin (e.g. from precipitation or other basins), minus water consumed through natural and anthropogenic uses, and any change in basin storage. As described in **Section 3.2.3.5**, several studies have developed a range of water budgets for the Steptoe Valley that account for natural processes that use water (primarily evapotranspiration) and anthropogenic uses (such as irrigation, domestic, industrial, stock watering, etc.). Water rights are a legal requirement for use of water in Nevada, and represent the cumulative use of water by people living and working in the State. The Nevada State Engineer's Office is responsible for administering water rights in a way that ensures that water will be put to beneficial use, and that water used will not exceed that which is available on an annual basis. One subject of **Section 5.2** is to discuss the availability of water for the Proposed Action and Action Alternative in the context of other foreseeable demands for available water in the Steptoe Valley Basin.

Surface Water Resources

Surface water hydrology of the project area is described in **Section 3.2** of this document and depicted on **Figure 3.2-1**. Direct and indirect impacts of the construction and operation of the proposed power plant and associated facilities are described in **Section 4.2**. Potential cumulative effects to surface water resources within the CEA can occur from any surface disturbance, change in vegetation, surface water withdrawal for irrigation or other purposes, change in land use or alteration of natural drainage patterns and deposition impacts that change water quality.

Water quality is discussed in **Section 3.2.3.2**, including water quality degradation that is attributed to past and current development.

Groundwater Resources

Groundwater conditions in the CEA are described in numerous studies, which were summarized and cited in **Section 3.2.3.5**, and will not be repeated here. Depths to groundwater at the valley margins, beneath Goshute Lake and along Duck Creek largely preclude surface activities from contaminating the valley fill aquifer. Therefore, the primary potential cumulative impact to groundwater is from withdrawal of water through pumping.

<u>Groundwater Quantity</u>

NDWR estimates the perennial yield or recharge of the Steptoe Valley Basin to be 70,000 acre-feet (NDWR 2007b). This is the quantity of water that can be pumped from groundwater annually without depleting stored groundwater.

See **Section 3.2.3.5** for further discussion of efforts to quantify groundwater budgets in the Steptoe Valley Basin and groundwater quality data.

Wetlands

Locations and descriptions of wetlands in the project area are found in reports by JBR (2007a) and Frontier Corporation USA (2007), which are summarized in **Section 3.2.3.3**. These include naturally occurring wetlands, as well as those created by developed facilities (e.g., irrigation reservoirs, irrigation or drainage ditches) or heavily influenced by anthropogenic development. See also **Figure 3.2-1**. Naturally occurring wetlands are primarily associated with surface water features such as streams and springs, but wetlands in the CEA also occur as wet meadows in

areas of local high groundwater. The USGS estimates that 52 percent of native wetlands in Nevada have been lost since European settlement. According to USGS (1996):

> More than one-half of Nevada's original wetlands have been lost, primarily due to conversion of wetlands to cropland and diversion of water for agricultural and urban use; many others have been seriously degraded by human activities. Some wetlands have been created by mine dewatering and sewage treatment.

5.2.3 Past and Present Disturbances

Surface Water Resources

The primary source of impacts to surface water resources is surface disturbance, which is directly affected by land use. Impacts can be to water quality or water quantity, which are interrelated in many cases (see **Section 3.2.2**). Types of development that might affect surface water resources would include road construction and maintenance, livestock grazing, timber harvest, agricultural activities, residential development, energy development, recreational trails/facilities, utility corridors, landfills, and mining activities. Point-source wastewater and storm drain discharges from urbanization and industrial development are regulated under National Pollution Discharge Elimination System (NPDES) permitting, which minimizes their impact on receiving surface water quality. Non-point storm water runoff from land uses such as transportation corridors, livestock grazing, and timber harvest are less easily regulated and have the potential to affect surface water quality as well as the timing and volume of surface water flows. Events such as wildfires or failed culverts can have impacts on water quality.

Analysis of cumulative effects on surface water for the EEC project is simplified by its location in the Steptoe Valley Hydrographic Unit, which is a closed basin, and the Proponents' proposed use of existing utility corridors outside the Steptoe Valley Basin. With the exceptions of portions of the transmission lines and northernmost portion of the Alternative Rail Line, most new facilities and surface disturbance from the project are confined within the Duck Creek drainage in the northern Steptoe Valley Basin. Active grazing and agricultural activities, including irrigation, dominate surface use in the CEA. The largest land disturbance related to industrial activity in this area is the reclaimed Kennecott tailings and slag disposal property adjacent to McGill.

<u>Land Use</u>

Table 5.1-1 gives land ownership by acreage and **Table 5.1-2** gives land uses for the surface water CEA. Note that there is a great range of potential impacts within some categories. For example, a paved multi-lane highway, like US-93, would have different impacts than an unpaved, abandoned logging road. Land use is described in greater detail in **Sections 3.12**, **4.12**, and **5.12**.

Agriculture, Forestry, and Similar Sources of Surface Disturbance. Other anthropogenic impacts to surface water in the transmission line CEA include reservoirs in the White River Basin, such as those in the Kirch Wildlife Management Area in Nye County (Adams-McGill, Cold Springs, Haymeadow, Whipple, and Dacey reservoirs) (NDOW 2007d). The Adams-McGill Reservoir was a ranch irrigation reservoir prior to its purchase by the Nevada Division of Wildlife (NDOW) in 1959 (NDOW 2007d). Irrigation reservoirs, diversions, and delivery systems (e.g., ditches) impact surface water by altering natural drainage systems as well as the timing and volume of runoff. Irrigated agricultural lands can result in increased sediment and nutrient loads in surface water.

Agricultural and forestry practices can alter or remove vegetation temporarily or over long periods. This has the potential to increase erosion and sediment delivery to streams or other surface water features. In addition, fertilizer and other chemicals applied to the land can be carried into surface water bodies. **Table 5.1-2** lists the areal extent of agriculture and related land uses in the CEA.

Vegetation loss and soil permeability can be severely impacted by wildfires and efforts to control them. During the most recent nine years, over 86,000 acres within the CEA burned, and most notably, nearly 68,000 of those acres burned in 2005 (BLM 2007i). Widespread burning of lands can result in deposition of sediment in surface water; loss of riparian areas (shading of streams and temperature effects); change in quantity and timing of runoff; and loss of the organic soil layer, impeding new vegetation and infiltration.

Community Development. Community development can affect quantity and timing of storm water runoff. Hardscaping, such as buildings, roads and parking lots, can affect surface water by reducing or eliminating infiltration over large areas and changing drainage patterns. This, in turn, affects the timing and quantity of overland flow and runoff to surface water features, and can lead to increased sediment yield by increasing the erosion potential of runoff by concentrating it. **Table 5.1-2** gives an indication of overall urbanization, roads, and industrial land uses within the CEA. Most roads and hardscaping development in recent years has integrated infiltration basins and other best management practices into their storm water design and permitting, substantially mitigating the effect of development on surface water resources.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas and Oil Exploration/Development). Development associated with extractive industry (mining, oil/gas exploration) includes road construction, drilling, mining disturbance, dewatering, and supportive facilities. Extractive industry disturbance is more likely to be long-term in nature as the extractive process is lengthy, and rehabilitation of disturbances can take many years. The extractive industry can impact water quality through increased acidity, metals, nutrients, or sediment in the water. Mining can affect both surface and ground water resources, and, in some cases, consumes substantial quantities of water.

KCC ceased operation of its copper mining and smelting in 1983. While the mine and smelter were operating, tailings and slag from the smelting process were deposited upstream (southeast) of Bassett Lake and Tailings Creek (Wiemeyer 2004). The tailings cover approximately 3,700 acres from a depth of about 10 feet in the western portion to as much as 90 feet on the eastern edge (Wiemeyer 2004).

Releases from the tailings area to surface water have occurred. A flash flood in 1975 resulted in a tailings release to Tailings Creek, which caused a fish kill estimated to involve 10,000 to 13,000 trout (Ecology and Environment, Inc. 1990). The tailings have resulted in metals and other contaminants in surface waters; and modification to drainage patterns and timing. USFWS reported analytical results for metals in surface water from multiple sampling events by several agencies over a 6-year period (Wiemeyer 2004). These are provided in **Table 5.2-1**. The report (Wiemeyer 2004) goes on to indicate the following:

In 1986, NDOW analyzed water, sediment, and fish from Bassett Lake (Ecology and Environment, Inc. 1990). They found 8.6 µg/g arsenic, 2,226 µg/g copper, and <0.25 µg/g mercury in sediment, as well as 0.04 µg/g mercury in fish. Copper tailings were said to have undoubtedly reached the lake.

Wetlands occur down gradient of the area, downstream of Bassett Lake. These wetlands provide habitat for up to six species that were previously classified as species of concern by the USFWS.

TABLE 5.2-1. ANALYTICAL RESULTS* FOR METALS IN BASSETT LAKE WATER SAMPLES (MICROGRAMS/LITER [µG/L])

YEAR	ARSENIC	CADMIUM	CHROMIUM	COPPER	IRON	LEAD	MERCURY	NICKEL	ZINC
1985				20	150				10
1986	<3			10	90		<0.5		nd
1988		<5		10	70	<5		20	<10
1990			50	20	90	<5		20	20

*as reported in Wiemeyer (2004)

Water diverted from Duck Creek that was used for mining and smelting operations is now used to irrigate vegetation on the reclaimed tailings area. The combination of water and vegetation has greatly reduced dust emissions from the tailings area,. Results of sampling in the USFWS study (Wiemeyer 2004) were summarized as follows:

> Two samples each of sediment, vegetation, and aquatic invertebrates, and three samples of fish were collected from the vicinity of the site of the McGill copper smelter in White Pine County, Nevada in August 1997. Concentrations of cadmium iron, mercury, manganese, and zinc in sediment samples from Bassett Lake, downstream of tailings on the smelter site, closely approached or exceeded threshold effect concentrations for aquatic ecosystems, whereas the concentration of copper greatly exceeded the probable effect concentration. Concentrations of boron, mercury, and zinc in biological samples from Bassett Lake exceeded threshold concentrations for adverse dietary effects to migratory birds or wildlife, whereas concentrations of chromium in aquatic invertebrates from creeks adjacent to tailings greatly exceeded the potential dietary effect level. The zinc concentrations in common carp from Bassett Lake and Tailings Creek were of concern.

Section 3.3.3.3 describes the mining districts within the project area. **Table 3.3-2** shows the project element nearest to each mining district, the mineral commodities (e.g., gold, copper, phosphate), and the mining claim number for active claims. **Figure 3.3-4** shows the locations of the districts. **Table 5.3-2** expands on **Table 3.3-2** to include a larger area (the minerals CEA), and historical context to mining in the area. **Section 3.3.3.3** also shows active oil and gas leases in the area and authorized geothermal leases. The preceding was obtained primarily from BLM databases. In addition to the active mines and oil and gas leases, there are mining claims within the CEA that have been abandoned or patented (BLM 2007i), such as a portion of the Robinson Nevada Mine (Mine Development Associates 2004) 22 miles west of Ely.

Abandoned mines can be troublesome for surface water, since many of them were mined before environmental regulations, reclamation bonding, or other types of permitting went into effect. At some sites, disturbed areas do not support plant growth, particularly on tailings or waste rock depositories. Consequently, these sites may yield higher sediment loads, acid mine drainage, metals, and other water quality contaminants. The Nevada Bureau of Mines and Geology (NBMG) estimates that there are as many as 225,000 to 310,000 inactive and abandoned mine sites statewide, including 102,464 that had been digitized statewide as of 1995, and 7,925 in White Pine County (NBMG 1995).

Table 5.3-1 shows current sand and gravel operations in the geology CEA, and **Section 5.3** describes other current, historic and anticipated mining activities in the project area. Gravel pits can result in deposition of sediment in surface waters, as well as changes in drainage patterns. Landfills in the project area are discussed in **Section 5.19**.

Grazing. In the case of the water resources CEA the predominant land use is grazing for livestock and for wild horses. **Figures 3.9-1a** through **c** and **Figure 3.9-2** show BLM grazing allotments and herd management areas, which are described in **Sections 3.9** and **4.9**, under Range Resources. Grazing can result in loss of vegetation leading to increased sediment delivery, promotion of less palatable species, loss of riparian vegetation, increased nutrients in surface waters, and stream bank failure due to trampling and loss of riparian vegetation. BLM is reducing grazing impacts through increased monitoring and use restrictions on new and renewed grazing leases.

Industrial Development. The Apex Industrial Park (the Park) is located at the southern tip of the CEA in Clark County. It is noteworthy that the Park appears to represent substantial industrial development in close proximity to the project area. The Park consists of 21,000 acres with contiguous lots ranging from 5 to 500 acres. The Park is zoned allowing most industrial uses, pays no corporate income tax, and has utility services access, including electric transmission and distribution service, an interstate natural gas pipeline, and fiber-optic communications capability. The Park currently contains operating power plants, as well as quarries, industrial facilities, and landfills. Existing utility infrastructure includes Reid Gardner Station, Harry Allen Substation, Chuck Lenzie Generating Station, numerous transmission lines, and other types of utilities (such as underground petroleum pipelines). These types of facilities can consume large quantities of water for process or cooling purposes. Permitting requirements under the federal Clean Water Act have mitigated impacts from wastewater at industrial facilities.

Recreation. BLM's Ely District contains the majority of the area within the CEA. Off-highway vehicle (OHV) activity is a popular recreational pursuit in Nevada (see description of recreational uses in **Section 3.14**). OHVs are notably destructive of natural resources under some conditions, damaging vegetation, compacting soils in some areas and breaking up soil in others. These impacts lead to increased erosion, changes in infiltration of precipitation, and mobilization of sediment. Restricting OHV use to well defined and maintained areas can substantially mitigate impacts to water resources.

Roads. Roads within the CEA result in changes in drainage patterns, vegetation, infiltration and wetlands. Sanding and deicer materials may affect vegetation and result in vegetative loss, ultimately impacting water quality through increased sedimentation. BLM's Ely District RMP (2007a) currently restricts OHV use to existing roads and trails. Previously, OHV use on the Ely District was unrestricted, and present use within the BLM's Southern Nevada District is unrestricted. Unrestricted use of OHVs results in a creation of a network of social roads that lead to a wide range of resource impacts. Vehicular trails greatly increase sediment delivery, overland flow, flood risk and erosion, while decreasing vegetation.

Utility Production and Distribution. Existing power production and distribution within the CEA includes the Harry Allen complex consisting of the generating station, switchyards, and substations; and segments of numerous transmission lines. Utility ROWs within the CEA have been developed for power transmission, and placement of water and gas pipelines and fiber optic cable. The majority of acreage disturbed within the CEA by utilities installation (for example, transmission lines associated with the Harry Allen Substation; and existing SNWA, Lincoln County and NPC transmission lines) is in the southern portion of the CEA, within the utility ROW.

The Kern River gas pipeline enters the southern tip of the CEA and terminates in the Apex Industrial Park. The project consists of a 36-inch diameter natural gas pipeline originating in Salt Lake City, Utah.

Utility line construction and operation can increase sediment, affect quantity and timing of runoff, and adversely impact water quality through snow management materials (including salts and sand). Construction of power generation facilities and towers supporting associated transmission lines have had short-term adverse impacts due to ground disturbance, and permanent adverse effects on water resources as existing permeable surfaces (vegetated areas) have been replaced by structures creating impermeable surfaces. Placement of existing water supply lines, gas lines, and fiber optic cable within utility ROWs also have resulted in ground-disturbing activities. However, because there are little or no surface facilities associated with these buried lines, there would be minimal permanent impacts.

Wastewater Discharge. NDEP Bureau of Water Pollution Control reports no industrial NPDES permits for discharge of wastewater to surface water in the Steptoe Valley Basin (Kaminski 2007). All sources permitted for wastewater disposal are classified as having "zero discharge to waters of the State" (Kaminski 2007). "Waters of the State" are defined as follows in Nevada Revised Statutes (NRS 445A.415):

> all waters situated wholly or partly within or bordering upon this State, including but not limited to:
>
> 1. All streams, lakes, ponds, impounding reservoirs, marshes, water courses, waterways, wells, springs, irrigation systems and drainage systems; and
> 2. All bodies or accumulations of water, surface and underground, natural or artificial.

This definition is quite broad and inclusive, covering closed basins and other waterbodies that are not federally regulated Waters of the U.S. (see **Section 3.2.3.3**).

<u>Water Use</u>

Table 5.2-2 shows surface water rights claimed in the Steptoe Valley Hydrographic Basin for the CEA, including all active rights in the basin north of, and including Township 16 North. The table is from the NDWR water rights database. It shows claimed water usage by type of use (e.g., irrigation, municipal, stockwatering, etc.) and annual volume in acre-feet/year (NDWR 2007a).

TABLE 5.2-2. CLAIMED SURFACE WATER RIGHTS IN THE STEPTOE VALLEY BASIN NORTH OF (AND INCLUDING) TOWNSHIP 16 NORTH

USE	SURFACE WATER VOLUME (AF/Y)
Industrial	42,714
Irrigation	64,330
Mining & Milling	10,296
Municipal*	7,246
Other	31
Power	4,706
Recreational	1
Stockwater	770
Wildlife	724
Total	**130,818**

*includes "quasi-municipal"

The NDWR database shows 395.53 acres in Steptoe Valley (T16N and north) as being irrigated from groundwater sources and 4,969.88 acres irrigated from surface water sources, including streams, springs, lakes/reservoirs or effluent (e.g., treated municipal sewer system waste water) sources. Under the Proposed Action and Action Alternatives, the Proponents would be using purchased (existing) water rights that have been in use for many years.

Groundwater Resources

Cumulative effects to groundwater in the CEA would consist primarily of groundwater withdrawals from wells or water quality effects caused by surface land uses that contribute contaminants to the groundwater beneath or down gradient from these land uses. Effects from timber harvesting, grazing, transportation or utility corridors, and other land uses on groundwater resources are negligible (see **Section 4.2**). Infiltration from the EEC waste disposal landfill and evaporation ponds would be negligible as designed and would have the potential to affect groundwater quality only if their liner systems fail. The only remaining active mining operations in the CEA are the KCC mine tailings, which are currently undergoing reclamation. As with surface water resources (see above) this section describes anthropogenic influences north of T15N basin-wide except where otherwise stated.

Land Use

Wastewater Discharge. Groundwater quality can be affected by wastewater discharge in several ways. Individual septic systems can contribute nitrates and other contaminants to groundwater if they are not functioning properly or if they are located too close, hydraulically, to the water table. In high groundwater areas activities at the surface can cause contaminants to leach into groundwater. Injection wells have been used for decades as a means of disposing of waste liquids, particularly from industrial sources. Underground storage tanks, like those commonly used to store gasoline and diesel at gas stations, leaked into, and contaminated, many aquifers over the years. An accounting of these potential contamination sources is found in **Section 5.19**.

The City of Ely discharges effluent from its wastewater facility through irrigation application during the growing season and rapid infiltration basins the remainder of the year (NDEP 2007b). Monitoring wells at both locations are sampled for nitrogen compounds and chloride. In only one exception did nitrate levels exceed the drinking water standard of 10 mg/l in quarterly samples from November 2002 through November 2006 (NDEP 2007b). Sample results were not reported for the McGill Waste Water Treatment Facility (NDEP 2007c).

Water Use

Table 5.2-3 shows groundwater use in the Duck Creek drainage of Steptoe Valley. The table includes active groundwater water rights by use in acre-feet/year, as published in the NDWR Hydrographic Basin Summary By Manner of Use (NDWR 2007b). In the third column, pending or protested rights are shown, and in the fourth column are estimates of actual use based on field surveys or other methods (see table footnotes). In the fifth column, column three entries have been subtracted from the active GW rights (column 2) and column four entries substituted to estimate actual annual use based on NDWR data. The final column is from the USGS BARCAS report (Welch and Bright 2007).

TABLE 5.2-3. GROUNDWATER USE IN THE STEPTOE VALLEY BASIN, NOV. 14, 2007

USE	ACTIVE GW RIGHTS (AFY)	PENDING APPLICATIONS OR PROTESTED RIGHTS (AFY)	NDWR ESTIMATES OF ACTUAL USE (AFY)	ESTIMATE OF WATER USE (AFY) BASED ON NDWR DATA	ESTIMATE OF WATER USE BY USGS (AFY)[5]
Commercial	17.92			17.92	
Domestic	6.97			6.97	855
Environmental	146.38			146.38	
Industrial	25,056.39	23,892[1]		1,164.39	
Irrigation	44,261.26	945	18,816[2]	18,816	12,859
Mining & Milling	21,279.69[3]			21,279.69	6,098
Municipal	5,066.32[4]			5,066.32	5,423
Quasi-Municipal	1,936.14	22.99		1,913.15	
Recreational	32.41			32.41	
Stockwater	199.23	72.20		127.03	84
Wildlife	2.45			2.45	
Total	**98,005.18**			**48,572.71**	**25,319**

1 Applications for new water rights submitted by Nevada Power and Sierra Pacific, who subsequently purchased irrigated land with water rights
2 Estimates based on 2006 field reconnaissance by NDWR (Perry 2007) and may include fields irrigated from surface water rights
3 Primarily water rights owned by Robinson Nevada Mining Company and KCC
4 These are primarily supplemental rights for the towns of Ely and McGill-Ruth
5 USGS estimates based on LANDSAT and other aerial imagery (Welch and Bright 2007)
Source: NDWR 2007b

NDWR estimates irrigated acreage for the Steptoe Valley Basin to be 5,379 acres for 2006, with an average application rate of 3.5 acre-feet/acre, resulting in use of 18,816 acre-feet of water (Perry 2007) as shown in **Table 5.2-3**. The NDWR estimate is based on field reconnaissance (Perry 2007). The USGS estimated 3,742 irrigated acres during the 2005 irrigation season with an application rate of 3.4 acre-feet/acre and total irrigation use of 12,859 acre-feet of water (Welch and Bright 2007). The USGS estimate is based primarily on LANDSAT and other aerial imagery.

Robinson Nevada Mining Company reportedly pumps 10,000 gallons/day (11.2 AFY) of wastewater to its tailings impoundment (which is south of the EEC groundwater CEA) (NDEP 2007a). Although most of the facilities of the Robinson Nevada Mine are in the Steptoe Valley Basin, the tailings impoundment is located in the White River hydrographic basin (Gray 2007). Mine operators demonstrated that the location and geology of the impoundment precluded the need for a liner; depth to groundwater at the site is 600-700 feet below the ground surface (Gray 2007).

The City of Ely and the towns of Ruth and McGill (McGill-Ruth Consolidated Sewer and Water General Improvement District) have municipal water supply systems. Ely has primary municipal surface water rights totaling 7,652 AFY and secondary municipal groundwater rights totaling 3,035 AFY; Ely also has irrigation rights (including effluent source rights) and stockwater rights. McGill-Ruth has primary municipal groundwater rights totaling 1,064 AFY and secondary municipal groundwater rights totaling 2,295 AFY (NDWR 2007a). Ely discharges an average of 0.937 million gallons/day (2.875 af/day = 1,049 AFY) and McGill-Ruth discharges an average of 0.180 million gallons/day (0.55 af/day = 201 AFY) (NDEP 2007b; NDEP 2007c). Water use from individual wells for rural residences is not well documented. Quasi-municipal uses are public or commercial water supplies that are not on a municipal system, such as rural truck stops, motels, or restaurants.

EMS-I (2008) modeled multiple scenarios for meeting the water supply requirements for the EEC. The results of EMS-I's modeling for cumulative effects is described in some detail later in **Section 5.2.6**, under "Cumulative Effects, Groundwater Pumping."

Wetlands

Anthropogenic influences on wetlands within the CEA are described in **Section 3.2.3.3**. A number of significant wetland features in the CEA were created and/or maintained as a result of human development. The wetlands complex related to Bassett Lake, Tailings Creek and Steptoe Slough were created, or strongly influenced by the KCC tailings impoundment and related activities, such as the irrigation of the tailings and associated pipes and canals. **Section 3.2.3.3** also notes several other wetlands in the project area that are created by or supported by other impoundments and by linear features (e.g., roads or rail lines) that have inadequate or nonexistent culverts in natural drainage ways, thus leading to standing water and "created" wetlands. Wetlands can be reduced through withdrawals of water from their water source, such as withdrawals from springs or streams.

5.2.4 Foreseeable Future Disturbances

Surface Water

<u>Land Use</u>

Agriculture, Forestry, and Other Sources of Surface Disturbance. The planned Spruce Mountain Restoration Project, located in southeastern Elko County, would encompass 552,000 acres and include a series of hazardous fuel reduction and habitat restoration treatments. Initial plans include vegetation treatments of 10,000 to 16,000 acres during the next five to seven years to reduce the risk of large-scale fires on Spruce Mountain (BLM 2007m). Projects like the Spruce Mountain Restoration Project cause short-term disturbance but long-term benefits to water resources by reducing wildfire risk, restoring native vegetation to pre-development conditions, and, in some cases, increasing water yield.

Airport Expansion. The Yelland Field, the airport north of Ely, is proposed for expansion. The conveyance of 1,545 acres of public land to White Pine County has been proposed to lengthen the runway by 5,000 feet and construct additional hangars and fencing. The Yelland Field Expansion project will allow for the expansion and development of airport facilities in White Pine County, and encourage development of air service and aviation-related industry. As with any urban development, hardscaping can have negative impacts on the timing and quantity of runoff without appropriate mitigation.

Community Development. Another prominent development within the CEA that would impact vegetation will be the Coyote Springs community development. The planned development, currently in initial stages of construction, is on private property located on the Clark/Lincoln County line, east of US-93 and separated from the Desert National Wildlife Range by the highway and the SWIP Corridor. The development is planned for a total of 43,000 acres, of which 12,000 acres are planned for a nature preserve, trail system, parks open spaces and multi-species habitat. In addition, the development is planned to include a 17-acre lake (Las Vegas Review-Journal 2007a) and several golf courses, portions of which are already complete (Coyote Springs Investment 2007). The first phase of development is planned to include 13,000 acres in Clark County, 3,000 acres of which would accommodate approximately 10,000 homes. Coyote Springs developers own 6,100 af/y of water rights; their application for an additional 16,000 af/y brought objections from federal agencies and environmental advocacy groups. The

Nevada State Engineer has put a five-year moratorium on new water rights in the area while a study of sustainable levels of water use from local sources can be completed. The moratorium is delaying construction of the project.

Expanded Recreation Facilities. The Desert NWR has released a Draft Environmental Impact Statement for development of visitor facilities within the Range. Existing visitor use facilities do not provide adequate capacity or opportunities to inform visitors about recreational opportunities and increased visitation is anticipated to further strain existing facilities. New facilities would include a visitor center and administrative complex, along with associated roads and parking areas (USFWS 2007f).

Extractive Industry (Mining, Mine Tailings, Gravel Pits). Oil and gas exploration and development are accelerating in the CEA, with BLM and the U.S. Forest Service (USFS) actively leasing lands for this use. The Humboldt-Toiyabe National Forest released a Record of Decision (ROD) authorizing 255,603 acres of National Forest for oil and gas exploration leases (USFS 2007d). The ROD minimizes erosion hazards by restricting leasing on hillsides with a high potential for slope failure or difficult restoration after project completion; the ROD also stipulates "No Surface Occupancy – 30 meter buffer on perennial streams, springs, ponds, and wet meadows and 15 meter buffer on seasonal or subsurface streams" (USFS 2007d) as a means of minimizing impacts on surface water quality. Inspections, regulations, and construction requirements for the handling of hazardous materials and the drilling and construction of wells would minimize the risk that fresh water aquifers would be contaminated through the exploration, production and closure of oil and gas wells (USFS 2007d). The proposed EEC transmission lines within the SWIP Corridor crosses the White Pine Division of the USFS project. With these and other restrictions on surface occupancy, road construction, and seasonal use, oil and gas development leasing by the USFS and the BLM would have minimal cumulative effect on water resources.

Grazing. The majority of the grazing permits within the CEA are managed under the Ely BLM District RMP. The FEIS for the RMP was issued August 2008 (BLM 2008a). Under the new RMP, the goal is to manage livestock grazing on public lands to provide for a level of livestock grazing consistent with multiple use, sustained yield, and watershed function and health. The objective is to allow livestock grazing to occur in a manner and at levels consistent with multiple use, sustained yield, and the standards for rangeland health. Management actions in support of this goal and objective include:

- Continue livestock grazing at current levels of 545,267 AUMs on 11,246,900 acres on a long-term basis.
- Unavailability of the following lands for livestock grazing:
    - Mormon Mesa, Kane Springs, and Beaver Dam Slope ACECs (203,670 acres);
    - Baker Archeological Site ACEC (80 acres) and Snake Creek Indian Burial Cave ACEC (40 acres);
    - Leased public lands associated with the Coyote Springs Development (6,200 acres); and
    - Private/Utah Allotment above Beaver Dam State Park (4,400 acres).
- Allowing allotments or portions of allotments within desert tortoise habitat, but outside of ACECs, to remain at current stocking levels unless a subsequent evaluation indicates a need to change the stocking level.

- Continuing to monitor and evaluate allotments to determine if they are continuing to meet, or are making significant progress toward meeting the standards for rangeland health. Changes, such as improved livestock management, new range improvement projects, and changes in the amount and kinds of forage permanently available for livestock use, can lead to changes in preference, authorized season-of-use, or kind of livestock. Such changes will continue to meet the RMP goals and objectives, including the standards for rangeland health.

While historic grazing practices have damaged upland and riparian vegetation as well as stream banks and water quality, public agencies, like BLM, are promulgating more stringent regulations for new and renewed grazing leases that will mitigate these impacts to water resources over time.

Industrial Development. Approximately 6,000 acres of the Apex Industrial Park are available for immediate sale and development for a wide range of industrial uses. A privately held travel-center developer plans to develop a first class travel center at the intersection of U.S. US-93. Providing excellent access to US-93, I-15, and the Union Pacific Railroad, the Park is marketing future development of commercial business (truck, retail, transportation, lodging), warehousing and distribution, light and heavy industrial, and light and heavy manufacturing.

Railroad Development. Reconstruction of the NNRy would take place within the CEA. The NNRy is an existing ROW, extending from northern Goshute Valley, near Shafter, Nevada south through Steptoe Valley to the City of Ely, Nevada. The project includes reconstruction of the existing railroad. The City of Ely and the White Pine Historical Railroad Foundation currently own the rail line and ROW, and intend to rehabilitate the track to support economic development in the Ely area. The Proponents are supporting the City/Foundation in the rehabilitation of the rail line under a Joint Development Agreement. Construction staging areas would be necessary along the ROW. These areas would be on private land and would be located every 20 to 50 miles. No fencing of the private ROW is anticipated. A borrow pit and other earth materials would be required for grade construction/rehabilitation. Because the NNRy is in such disrepair, construction, operations, maintenance, and abandonment for the rehabilitation of the NNRy and the Alternative Rail Line would be very similar and are discussed in **Section 2.2.4**. The exception to the similarities would be that major grading activities would not be required for the NNRy rehabilitation. Disturbance from reconstruction of the NNRy may have a minor impact to surface water resources during construction, but, in the long-term, bringing the tracks up to today's standards for drainage and storm water, and maintaining the tracks, will reduce impacts compared to having abandoned tracks running through the area. Abandoned rail lines impact water resources when unmaintained culverts and bridges become clogged with debris, which can lead to loss of wetlands downgradient, flooding, and erosion of the railroad grade or adjacent streams. By contrast, well-maintained rail lines are regularly inspected and treated for weeds, storm drainage facilities, general safety, and the condition of the rails themselves, which reduces the risk of derailments.

The proposed railroad to serve a geologic repository at Yucca Mountain (for the storage of nuclear waste) would transect the CEA in north central Lincoln County. During construction, approximately 600 acres would be disturbed within the CEA (USDOE 2007b), and a small portion of that area would be permanently occupied by the rail line. This line would have minimal impact on surface water resources.

Recreation. The population of White Pine County is projected to temporarily increase with construction of both the EEC and WPES (**Section 4.17.2.1** and BLM 2007e). Increased

population would likely also increase recreational pressure on surrounding public lands. Increased ground disturbance from social roads and trails caused by increased recreational use would impact water resources.

Roads. Nevada Department of Transportation, the counties, and federal agencies have ongoing road improvement projects in their jurisdictions (see **Appendix 5A**, Past, Present and Reasonably Foreseeable Projects). Disturbance during construction, and increase hardscaping, affect the timing, quantity, and quality of runoff (e.g., suspended and dissolved sediment), but standards for storm water management on new roads and on road improvement projects mitigate these impacts to a minimal level.

Utility Production and Distribution. The most prominent disturbance within the CEA is utility corridor development. Three major planning efforts address the development of utility corridors: The West-wide Energy Corridor (WWEC) Programmatic EIS (PEIS), the designated BLM Utility Corridor, and the SWIP Corridor. The WWEC would encompass the BLM Utility Corridor and the SWIP Corridor. All three corridor projects address the utility corridor within the CEA in their planning (NEPA) documents.

The WWEC PEIS plans for a 3,500-foot-wide corridor where possible, and specifies actual widths allotted along various segments. The WWEC PEIS provides examples of full utilization of the corridor:

- Assuming an operational ROW width of 400 feet, about nine individual 500-kV transmission lines could be supported within a 3,500-foot-wide corridor
- As many as 35 liquid petroleum pipelines (each consisting of a 32-inch-diameter pipe and a 100-foot construction ROW) within a 3,500-foot-wide corridor
- 29 natural gas pipelines (42-inch diameter pipe and 120-foot construction ROW) within a 3,500-foot-wide corridor

The corridor would likely have a combination of several of the above utilities.

All segments of the proposed SWIP Corridor utilized for the transmission lines associated with the proposed EEC are designated to be 2,640 feet wide in the WWEC PEIS, except for Segment 10, which is designed to be 3,500 feet wide. At full utilization, the SWIP Corridor (except Segment 10) could contain as many as 6 500-kV transmission lines, 26 liquid petroleum lines, or 22 natural gas pipelines.

With the high percentage of public land in Nevada, linear projects must undergo public scrutiny through NEPA and are subject to state and federal environmental regulation. In addition, while buried utilities may disturb a significant number of acres during construction, permitting regulations require prompt revegetation of disturbed areas. In most of these corridors vegetation is not allowed to grow over a certain height (e.g., 6 feet), which alters the vegetation long-term, and therefore, to some degree, impacts water resources. At the same time, after the disturbance of construction is complete, land contours are generally restored and vegetation is reestablished, which minimizes impacts to water resources.

White Pine Energy Associates, LLC. (WPEA) has proposed construction of a coal-fired power plant approximately 34 miles north of Ely, Nevada in Township 22 North and Range 64 East. The proposed project would include the following:

- Issue ROWs for construction and operation of all station features on BLM-managed land and subsequent sale of the power plant site to WPEA. Long-term right-of-ways for the facility would cover 2,409 acres; 1,902 acres would be disturbed during construction;

and 1,510 acres would be disturbed permanently through the operations life-cycle of the plant. The proposed lined evaporation pond would cover 90 acres (including berms and setbacks), and would be used to dispose of both wastewater and storm water (a "zero-discharge" facility).

- Construct and operate up to a three-unit, approximately 1,590-MW coal-fired, hybrid-cooled power plant.
- Construct and operate a 32-mile-long overhead 500-kV transmission line connecting the Duck Creek Substation to the Thirtymile Substation. Construct and operate a 2.5-mile-long loop of the overhead 500-kV SWIP line connecting to the Duck Creek Substation.
- Construct and operate the 60-acre Duck Creek Substation at the power plant and the 77-acre Thirtymile Substation near Robinson Summit.
- Construct and operate a 1.3-mile-long rail spur crossing Duck Creek and connecting to the upgraded NNRy.
- Construct and maintain a 1-mile-long paved access road from US-93.
- Construct and operate a system of 8 wells north of the power plant site.
- Construct and operate 13 miles of 10- to 30-inch-diameter water pipeline connecting the wells to the power plant.
- Construct and operate 13 miles of 13.8-kV overhead distribution lines and a 10-foot-wide access road servicing each well site.
- Use, during construction, a 40-acre earth and rock borrow area.

The original proposal for the plant used a conventional wet cooling system that would have required up to 25,000 AFY of groundwater for the 1500 MW plant. The current proposal would use a hybrid cooling system that would require up to 5,000 AFY of groundwater for the plant. Project proponents would use existing White Pine County groundwater rights. In addition to cumulative effects from use of groundwater resources in the basin, land use changes and disturbance have the potential to impact and degrade surface water resources. Hardscaping of roadways, buildings, parking lots and other facilities affects timing and quantity of surface water runoff. Disturbed land surface and loss of vegetation can contribute to sediment delivery to surface water features (BLM 2007e). Potential risks from deposition of air contaminants is described in **Section 4.6** (human and ecological health risk assessments) for the EEC, and potential cumulative effects from combined deposition from both the EEC and WPES projects is described in **Section 5.6.6**.

Nevada Wind Company has identified a site in the North Egan Range for development of potential wind generation facilities. The proposed project would cover 4,470 acres. North Wind Energy has been monitoring the site and is expected to propose development. A 4,536-acre project has been proposed by Enexco, also in the North Egan Range.

The proposed UNEV petroleum products pipeline would enter the southern tip of the CEA, terminating at the Apex Industrial Park. The proposed project includes a 12-inch petroleum pipeline originating in Salt Lake City, Utah. After the brief period of construction the pipeline would have negligible impact to water resources.

Groundwater

Water Use

The Southern Nevada Water Authority (SNWA) has applied for groundwater rights in Clark, Lincoln, and White Pine counties totaling 167,000 AFY, and has secured water rights in the Spring Valley basin for 40,000 AFY for 10 years and potentially 60,000 AFY thereafter (SNWA 2008). The use of the water is to meet growing municipal and domestic needs in Las Vegas and Clark County. Applications are pending for the Snake Valley, Cave Valley, Dry Lake Valley, Delamar Valley, and Coyote Spring Valley. No direct claims are proposed on the over-appropriated groundwater resources of the Steptoe Valley Basin; however, there is considerable speculation and disagreement within the scientific community on possible interbasin movement of groundwater, primarily through the carbonate aquifer which underlies both the local valley fill alluvium aquifers and the regional fractured volcanic layer (SNWA 2008; Welch and Bright 2007; Mayo 2007a; EMS-I 2008). The USGS BARCAS study has suggested specifically that groundwater from the Steptoe Valley Basin may feed the Spring, Lake, and White River valleys, based on the higher water table in the Steptoe Valley Basin (Welch and Bright 2007; Bright 2007). The Nevada State Engineer, who is responsible for issuing and administering water rights in Nevada, is studying and ruling on the SNWA applications basin by basin (SNWA 2008).

In related projects, the Lincoln County Water District (LCWD) has applied for water rights and rights-of-way in the Kane Springs Valley (BLM 2007j), the Tule Desert Valley, and the Clover Valley to support municipal development in Lincoln County, including water for the Coyote Springs residential development. The SWIP Corridor goes through the Kane Springs Valley project area. The Nevada State Engineer has awarded 1,000 AFY to the project and an application for an additional 17,380 AFY is pending (BLM 2007j). Both the USFWS and the National Park Service filed objections to the project citing potential adverse impacts to those agencies' senior rights at their facilities. Both agencies have since signed agreements with the LCWD (BLM 2007j).

Phase II of EEC would have a requirement for additional industrial water, the quantity of which has not yet been determined.

Wastewater Discharge. With the population of White Pine County projected to decrease over the next 20 years (Crispin and Isaacson 2008) without the EEC and increase by approximately 9 percent after construction (Crispin and Isaacson 2008), increases in population and associated wastewater would be moderate.

Wetlands

The reasonably foreseeable developments with the potential to impact wetlands in the CEA are the same as those described above.

5.2.5 Cumulative Disturbances

Table 5.1-3 shows the acreage that would be disturbed by the reasonably foreseeable activities in the CEA. The table is based on the Proposed Actions as described in the respective EISs, NOIs, or other documents.

Surface Water

Quantifying the past and present surface disturbance in the CEA requires clarifying assumptions for a number of reasons, including the following:

- disturbances from various sources may overlap, such as utility corridors and grazing allotments,
- impacts of wildfires on a watershed, or the extent of these impacts, cannot always be accurately determined,
- historical disturbances, such as abandoned mines and old roadways, may have been reclaimed naturally over time or by agency action, and
- filling or draining of wetlands was common practice for many years and acreage was not recorded, therefore, a baseline or starting point may not be definite.

Consequently, the past and present surface disturbance in the CEA that could actually impact surface water could range from the sum of all disturbances in the CEA, which would be 1,924,232 acres (see **Table 5.1-2**) out of the total area of the CEA, which is 1,992,334 acres (96.6 percent). This includes all acres in grazing allotments, as well as urban areas, highways, mine tailings, and burned areas. To lump all of these types of disturbances together would not provide an accurate picture of the CEA, much of which, though grazed or burned, is relatively undisturbed. Removing these two disturbance categories (grazed and burned) leaves areas of long term disturbance, and a total disturbed acreage of 33,648 acres or 1.7 percent.

Groundwater

The known quantity of groundwater that would be consumed is represented in **Table 5.2-4**; note that some projects only partially overlap the CEA, so some or most of those acres may be outside the surface water CEA. Additional projects may be found in **Appendix 5A**.

TABLE 5.2-4. WATER CONSUMPTION FROM REASONABLY FORESEEABLE PROJECTS

PROPOSED PROJECT	WATER CONSUMED (AFY)
Coyote Springs community development	Owned 6,100 Additional Requested 16,000
Southern Nevada Water Authority (SNWA) Snake Valley	60,000
White Pine Energy Station	5,000
Ely Energy Center (EEC)	8,000
Lincoln County Water District (for Kane Springs Valley)	17,380
Totals	112,480

Direct use of surface water would occur if the Duck Creek water supply option were employed.

See also **Section 5.2.6** below.

5.2.6 Cumulative Effects

Surface Water

Under the Proposed Action or Action Alternatives cumulative effects to surface water resources in the surface water CEA would be negligible to minor, based on the findings in **Sections 3.2, 4.2** and **5.2**. Best management practices and storm water management during construction and operation would prevent any significant storm water runoff or wastewater from disturbed or hardscaped areas from reaching surface water features, groundwater, or wetlands. During operations, permitting requirements would ensure that water quality standards are met.

Should the water supply option be chosen for the EEC (piping surface water from the Duck Creek Impoundment to the South or North Plant Site), impacts to the perennial reaches of Duck Creek and the complex of water bodies and wetlands around the KCC tailings and Bassett Lake would occur. These impacts would be long term and moderate to major.

As discussed in **Section 4.2.2.1**, deposition of nitrogen and sulfur compounds from carbon fuel combustion sources can potentially cause changes in the pH and dissolved solute chemistry of surface waters exposed to this deposition. The emissions of this type from the EEC along with those of other combustion sources in the air quality CEA could pose potential cumulative effects on surface waters within this CEA. The cumulative effects of other COPCs in the emissions from both the EEC and WPES were modeled for aquatic organisms in the near field area and are discussed in the Risk Assessment narrative in **Section 5.6**.

<u>Groundwater Pumping</u>

EMS-I (2008) modeled the combined (cumulative) effects of the proposed groundwater pumping of the EEC (8,000 AFY) and WPES (5,000 AFY) power plants. Detailed discussion of the methods of the analysis are available in the EMS-I report (EMS-I 2008); the report and a summary are provided with the EIS distribution CD. The cumulative effects scenario assumed EEC pumping at the Lages Station plus a single well at the power plant site, pumping simultaneously with the Proposed Action well field for White Pine Energy Station power plant for a period of 50 years. **Figure 5.2-3** shows the maximum drawdown after 50 years of pumping as determined through EMS-I's modeling. EMS-I (2008) found the following:

> Quasi-steady state conditions were achieved after 50 years of pumping and bi-annual change of head at each of the modeled wells was less than one percent. Maximum drawdown of 14.8 feet was observed at EEC-5 with an initial depth to water at that location of 60 feet. An area with one or more feet of drawdown extended to about 5 miles to the southwest of the well field and about 4.5 miles to the northwest of the well field. Drawdown greater than about 3 feet was localized to the general area of the well field and the area northeast of the well field.

The authors went on to conclude:

> The maximum area with drawdown greater than 1-foot in the vicinity of the White Pine Energy well field extended about 1 mile south of the well field and about 1.5 miles north, extending to the edge of both the eastern and western boundaries of the model.
>
> Drawdown under the northern Duck Creek channel and Goshute Lake was less than 2 feet. Drawdown in the vicinity of the alluvial fan springs located west of Goshute Lake was less than 2 feet with an estimated starting depth to water of 50 feet. Based upon the depth to water in the Valley-Fill Aquifer that would be affected and maximum drawdown observed in the vicinity of the springs, the modeling indicates that the proposed pumping will not impact the natural recharge and discharge processes of the alluvial fan springs.
>
> Drawdown in the vicinity of the alluvial fan springs located near Warm Springs, west of Duck Creek, was less than two feet. Based upon the depth to water in the Valley-Fill Aquifer that would be affected and maximum drawdown observed in the vicinity of the springs, the modeling indicates that the proposed pumping will not impact the natural recharge and discharge processes of the alluvial fan springs. (EMS-I 2008)

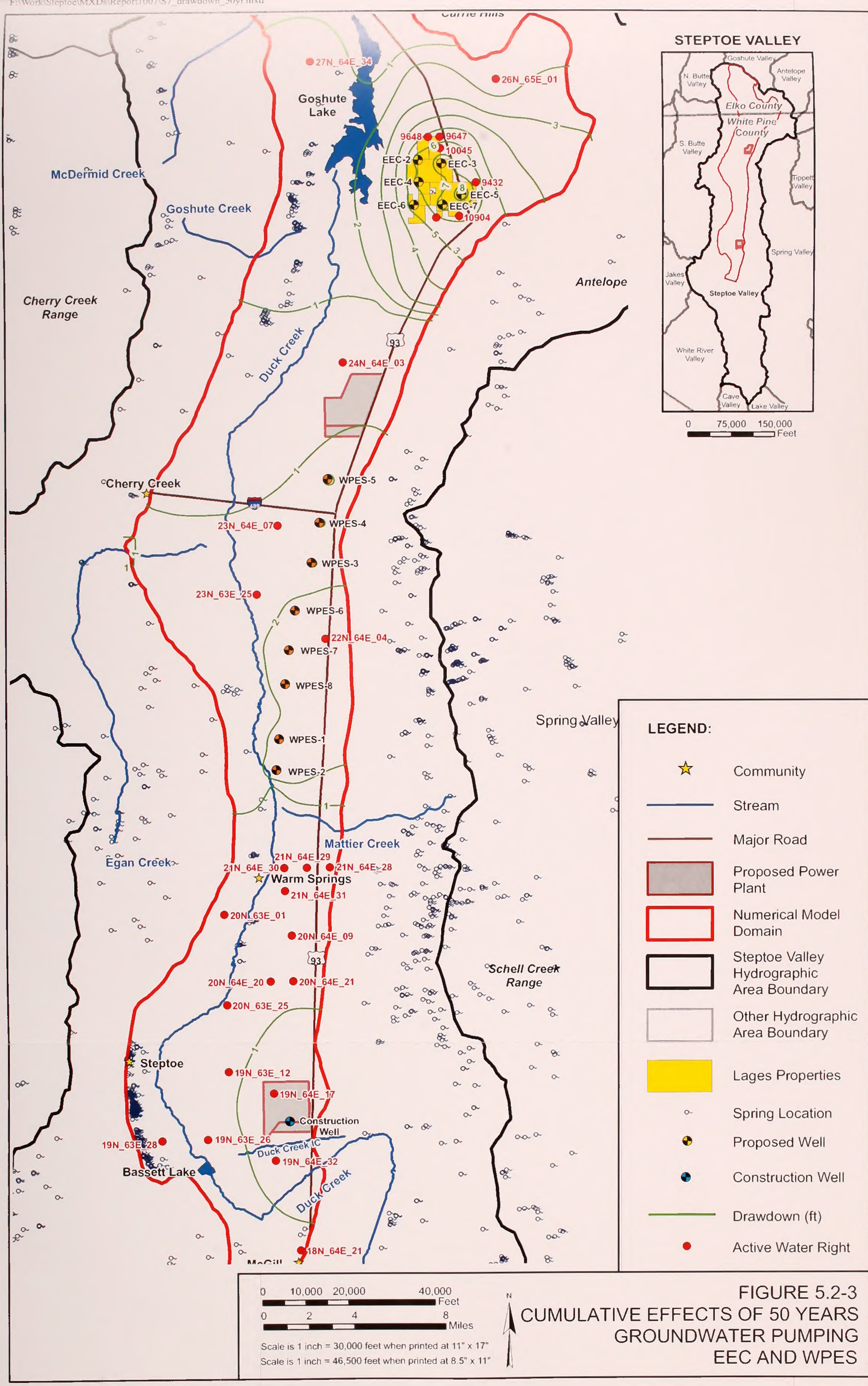


FIGURE 5.2-3
CUMULATIVE EFFECTS OF 50 YEARS GROUNDWATER PUMPING EEC AND WPES

The combined groundwater usage of the EEC and WPES would total 13,000 AFY. As shown in **Table 5.2-3**, current (2007) groundwater use in the Steptoe Valley is estimated between 25,319 and 48,573 AFY, although up to 98,005 AFY may be pumped under existing water rights, including the water rights that have been purchased by Nevada Power Company for the EEC. Many of these existing water rights are supplemental to surface water rights and would likely only be used when surface water is not available, for economic reasons (e.g., groundwater rights are typically more expensive to utilize, given the added expense of pumping). Other major groundwater users include the mining and milling rights owned by Robinson Nevada Mining Company and KCC (used to irrigate the tailings at McGill), and the municipal rights owned by the towns of Ely and McGill-Ruth.

As with the alluvial fan springs, the substantial distance between the valley-fill aquifer water table and surface features, including streams and wetlands, precludes impacts to surface water features as a result of groundwater pumping for the South Plant Site or the North Plant Site Alternative. Some of the groundwater source alternatives, such as those using the Coyote Valley Ranch Well Field and the southern well field, had the potential to adversely affect wetlands associated with the complex comprised of the KCC Tailings, Steptoe Slough, Duck Creek, Tailings Creek and Bassett Lake (Mayo 2007b; EMS-I 2008).

In conclusion, cumulative effects of groundwater pumping for both the EEC and the WPES would be moderate, but within the allowed, sustainable limits set for the aquifer by the Nevada State Engineer.

<u>Wetlands</u>

Under the Proposed Action or Action Alternatives, cumulative impacts to wetland resources in the surface water CEA would occur, but the effects, even when combined with those for past, present, and reasonably foreseeable projects, would be minimal. The extensive historical damage to wetlands has occurred primarily from conversion to cropland or similar activities (see **Section 5.2.2**). With the possible exception of the extensive complex of wetlands around the KCC tailings and Bassett Lake (which were largely created by KCC mining and milling activities), it is unlikely that groundwater pumping has affected wetlands in the Steptoe Basin, based on the lack of direct connection between groundwater and surface water features (see under Groundwater Pumping in this section) (Mayo 2007b; EMS-I 2008). The White Pine Energy Station estimates temporary impacts (construction) to wetlands on 6 acres and long-term effects to 4 acres under the Proposed Action; and for its Alternative 1, temporary impacts to 27 acres and permanent impacts to 6 acres (WPES DEIS Table 4.5-1 and Table 4.5-2). EEC estimates that temporary impacts to 9.4 acres of wetlands (transmission line) would occur under the Segment 3 Alternative with 0.2 acres of permanent impact (**Section 4.2.2**). For the North Plant Site Alternative, electric transmission line Segment 1A Alternative, there would be, at a maximum, an additional 18.8 acres impacted temporarily and 0.8 acres long-term (**Section 4.2.3.2**). Other wetlands along the electric transmission line would be avoided, and drawdown of the water table from groundwater pumping would not affect wetlands (EMS-I 2008).

Under the EEC water source alternative of using surface water rights from the Duck Creek Impoundment (currently used, in part, by KCC to irrigate its tailing impoundment), there would likely be impacts to wetlands and other surface features associated with the complex comprised of the KCC Tailings Impoundment, Steptoe Slough, Duck Creek, Tailings Creek, and Bassett Lake. The extent of these impacts cannot be quantified with or without the cumulative impacts from White Pine Energy's groundwater withdrawals.

5.3 Geology, Minerals, and Topography

5.3.1 CEA Boundary

The CEA for geology, minerals, and topography consists of a 2.5-mile buffer surrounding the direct effects study area, including the Proposed Action and Alternative power plant sites; proposed Alternative Rail Line ROW; Proposed Action and alternative water supply surface disturbances and pipeline ROWs; and the proposed transmission lines and alternatives (including the SWIP Corridor) and substations (**Figure 5.3-1**). The total area of this CEA is 1,623,527 acres.

Rationale

The direct and indirect effects of the Proposed Action and Action Alternatives on these resources would be confined to the actual disturbance areas. However, the boundaries of the plant sites and the project areas outside the plant sites are larger than the actual disturbance areas within them and impacts to these resources would be undetectable outside of these larger boundaries.

5.3.2 Introduction

Potential effects to the geology, mineral, and topographic resources consist of mineral resource depletion, removal of mineral resources from availability for development, and topographic changes. Coal, diesel, and other mineral resources consumed in meeting the project purpose and need are also considered.

Sections 3.3 and **4.3** discuss in detail the geology of the project area and the project's likely affect on mineral resources, respectively. **Figures 3.3-2a** through **c** show geological resources of the project area.

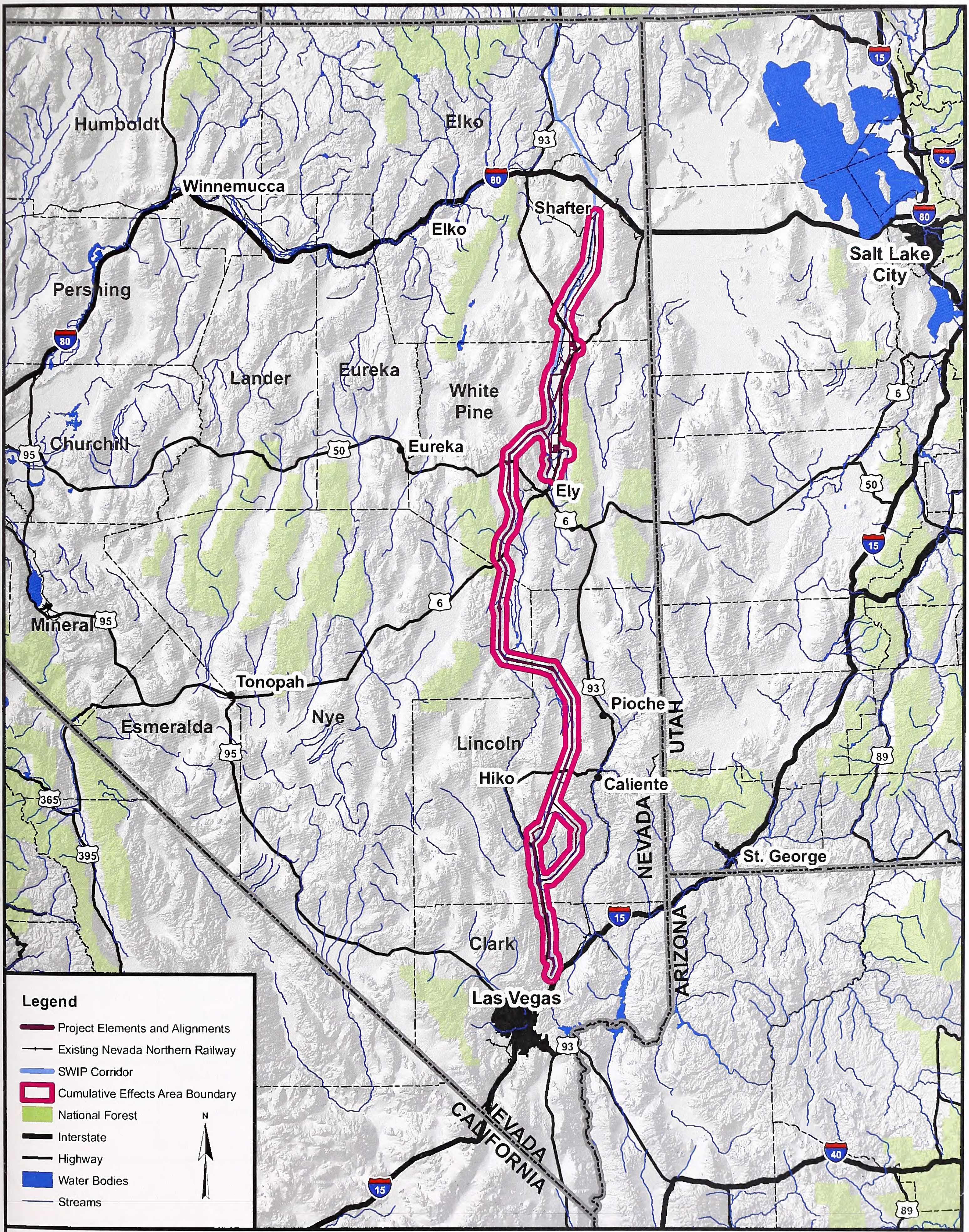
The past, present, and future disturbances with cumulative impacts to geology, minerals and topography discussed below are described in detail in **Sections 5.3.3** and **5.3.4**.

5.3.3 Past and Present Disturbances

Current land ownership and uses within the geology, minerals, and topography CEA are presented in **Tables 5.1-1** and **5.1-2**, respectively.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Oil & Gas Exploration/ Development)

The NBMG shows no major mines in the CEA (NBMG 2007). **Table 5.3-1** shows mining operations in the CEA, taken from the Nevada Department of Business & Industry (NDBI) Directory of Mine Operations for 2006 (NDBI 2007), which includes smaller operations than the NBMG major mines database. All of these operations are in or are adjacent to proposed transmission ROWs.



Source - Base Map: ESRI and National Atlas of the United States

1:3,400,000

40 0 40 Miles

60 0 60 Kilometers

Scale is 1:3,400,000 when printed at 8.5"x11"

FIGURE 5.3-1
CUMULATIVE EFFECTS AREA FOR GEOLOGY/MINERALS, TOPOGRAPHY, AND PALEONTOLOGICAL RESOURCES
ELY ENERGY CENTER

TABLE 5.3-1. MINING OPERATIONS IN THE CEA (NDBI 2007)

OPERATION NAME	COUNTY	SECTION, TOWNSHIP, RANGE	COMMODITY/OPERATION
American Asphalt & Grading Co.	Clark	Sec 21, T13S, R63E	Aggregate, rock, sand, crushing
Silver States Landfill at Apex	Clark	Secs 13, 14, T18S, R63E	Sand, sand/gravel, crushing, screening
Coyote Springs Service Rock Products	Lincoln	Sec 13, T11S, R62E	Sand/gravel, crushing, screening
Nevada Slag Inc.	White Pine	Sec 2, T18N, R64E	Abrasives and slag products
White Pine County Public Works Pit	White Pine	Sec 31, T17N, R64E	Sand, sand/gravel, crushing, screening

Transmission lines, the private railroad alternative route, the South Plant Site and associated facilities overlap with mining districts where mining could have occurred in the past (see **Figure 3.3-4**). As described in **Section 5.2**, a substantial number of abandoned mine sites are found throughout the CEA. As commodity prices fluctuate and new uses are found for specific metals and other mineral products, some of these abandoned resources may become economically viable in the future and reopened. Since the major components of the EEC project are located on alluvial fans and basin-fill material, it is highly unlikely that construction and operation of the EEC would preclude development of any metallic mineral resources in the area. **Table 5.3-2** gives some history of the mining districts, which overlap or are adjacent to project facilities; the table is taken from NBMG Report 47, "Mining Districts of Nevada" (1998).

TABLE 5.3-2. MINING DISTRICTS IN THE EEC PROJECT AREA (NBMG 1998)

NAME/ COUNTY	YEAR ORGANIZED/ COMMODITIES	COMMENTS
Arrow Canyon Range/ Clark	silica, building stone	The Arrow Canyon Range lies east of U.S. US-93 about 8 miles west of Moapa. Silica and building stone deposits occur along the east and west flanks of the southern part of the range.
Bristol/ Lincoln	1971/ silver, copper, lead, zinc, gold, manganese, montmorillonite	The Bristol district is located in the northern Bristol Range about 15 miles north of Pioche. The historic Blind Mountain district (1871) covered the southern part of the present district. Bristol originally included only the area around mines on the western slope of the Bristol Range, and the Jackrabbit district included the area on east side of the range.
Cherry Creek/ White Pine	1872/ silver, gold, lead, copper, zinc, tungsten, antimony, coal, fluorspar, beryllium	The district extends from Cherry Creek Canyon in the south end of the Cherry Creek Range to north of Paris Ranch Canyon. The Gold Canyon (Egan Canyon) district, located in Egan Canyon about 5 miles to the south, was formerly included in the Cherry Creek district. Butte Valley, to the west, is also sometimes included in the Cherry Creek district.
Currant/ Nye & White Pine	1914/ gold, lead, copper, tungsten, magnesite, uranium, fluorspar	This district encompasses the southern White Pine Range, the Horse Range, and the northernmost part of the Grant Range. Kral (1951) included Railroad Valley (Butterfield) Marsh along with Silverton, to the west, in a large Currant district. Deposits of magnesite occur in the White Pine County part of the district.
Delamar/ Lincoln	1892/ gold, silver, copper, lead, perlite	Delamar came into use as the district name starting in mid-1930s. The main portion of the Delamar district is located on the western front of the range between Monkey Wrench Wash and Cedar Wash, although the district extends to the east almost to Rainbow Canyon and includes the upper part of Taylor Mine Canyon.

NAME/ COUNTY	YEAR ORGANIZED/ COMMODITIES	COMMENTS
Dolly Varden/ Elko	1872/ copper, silver, lead, zinc, gold, molybdenum, thorium and rare earths, uranium	Situated at the northern extremity of the Schell Creek Range (Dolly Varden Mountains). The original Dolly Varden district was located on the east side of the mountains; the Granite [Mountain] district was 3 miles to the west; and the Mizpah district was located to the north, near Mizpah Spring. All three areas are included in the present Dolly Varden district.
Duck Creek/ White Pine	1869/ lead, silver, copper, zinc, gold, limestone, fire clay	The Duck Creek district is located in the Duck Creek Range, a narrow ridge lying west of the main part of the Schell Creek Range. The northern part of the district was originally known as Enterprise (1869), the southern part as McDougal. The area on the west slope of the Duck Creek Range, opposite the Ely airport, was known as Peacock.
Ely Springs/ Lincoln	silver, zinc, lead, gold	The Ely Springs district is on the west side of the Ely Springs Range, about 13 miles west of Pioche.
Gold Canyon/ White Pine	1863/ gold, silver	This district is located in Egan Canyon and the northern part of the Egan Range, 5 miles west of Cherry Creek. The area is sometimes included in the Cherry Creek district.
Granite/ White Pine	1869/ lead, silver, gold, tungsten, copper	Located on the east slope of the northern Egan Range, north of the San Francisco district and 36 miles north of Ely. The district was described as near Perly's ranch but on the opposite side of the range. Discoveries in 1894 resulted in organization of the Granite district, near Granite railroad siding and the town of Steptoe. The area was referred to as the Gosiute district in 1916.
Hunter/ White Pine	1871/ lead, copper, silver, gold, uranium	Situated on the western slope of the northern Egan Range, 10 miles south of Egan Canyon and about 15 miles north of Robinson Summit.
Meadow Valley Mountains/ Lincoln	gold, silver, uranium	Located east of U.S. US-93.
Pequop/ Elko	phosphate, barite	Covers the area of phosphate occurrences in the southern Pequop Mountains, east of and adjoining the Spruce Mountain district, and all of the northern Pequop Range, including the portion north of Interstate 80.
Robinson/ White Pine	1868/ copper, gold, silver, zinc, lead, iron, manganese, tungsten, molybdenum, rhenium, platinum, palladium, nickel	The Robinson district is centered near the towns of Ely and Ruth, in the Egan Range. Originally organized as the Robinson district and includes the towns of Ely, East Ely, Ruth, Reipetown, Veteran, Kimberly, and Lane City (formerly Mineral City). New was located 7 miles west of the site of Mineral City.
Ruby Hill/ White Pine	1872/ silver	The Ruby Hill district is on the crest and western slope of the Schell Creek Range on the divide between Ruby and Indian Creeks. This area, along with Schellbourne and Siegel, was included in the historic Schell Creek district; in 1871 Ruby Hill was separated from the others and organized as a separate district.
San Francisco/ White Pine	1869/ silver, lead	The district occupies Heusser Mountain, an extension of the Egan Range west of McGill. Mines are located on the mountain's eastern and southwestern flanks, north of Hercules Gap (Hercules Gate).
Schellbourne/ White Pine	1871/ silver, tungsten	This district is located in the vicinity of Lovell Peak on the crest of the Schell Creek Range, north of Schellbourne Pass. Schellbourne is the northernmost of the five small districts sometimes included in the large Aurum district that covered all of the northern Schell Creek Range.
Silver Canyon/ White Pine	1880/ lead, silver, copper, gold	Located at the head of Silver Canyon, west of the site of old Aurum. Silver Canyon is the third district from the north of the five small districts sometimes grouped into the large Aurum district, covering all of the northern Schell Creek Range.

NAME/ COUNTY	YEAR ORGANIZED/ COMMODITIES	COMMENTS
Silver King/ Lincoln	1874/ silver, lead, copper, gold	The Silver King district includes a small area near Silver King Well on the west side of the southern Schell Creek Range (historic Lake Valley Range) in T7N, R62E, 16 miles northwest of Bristol, Lincoln County, and about 12 miles southeast of Sunnyside, Nye County.
Telegraph/ White Pine	1883/ gold, tungsten	The district includes the drainage area of Telegraph Canyon, north of Telegraph Peak in the Egan Range, and lies generally between the Gold Canyon and Granite districts.

Section 4.3 describes in detail current oil and gas leases in the project area, as recorded in the BLM database. **Table 5.3-3** is taken from the Nevada Oil and Gas Well Database (NBMG 2004), last updated in 2004. All of the wells in the table are within the CEA. Out of the 35 wells that were permitted, ten were never drilled (as of 2004) and 24 were abandoned; the status of the remaining well, permitted in 2002, is described only as "drilled." Despite the outcome of these wells, the leases identified in **Section 4.3** demonstrate renewed interest in finding and producing oil and gas in the CEA.

TABLE 5.3-3. NEVADA OIL AND GAS WELLS IN THE CEA AS OF 2004 (NBMG 2004)

COUNTY	SEC	TOWN	RANGE	PERMIT ISSUED	STATUS*	DEPTH (FT)	SHOW
Clark	14	18S	63E	10 JUN 81	P & A	17,110	Gas
Clark	7	18S	64E	02 JUN 50	A	1,455	
Elko	19	28N	64E	14 OCT 80	Never Drilled		
Elko	12	28N	64E	28 MAR 91	P & A	8,601	Oil Gas Water
Elko	19	32N	67E	03 NOV 75	P & A	5,569	
Elko	2	34N	66E	22 MAR 83	P & A	8,000	
Elko	07	34N	67E	06 NOV 03			
Nye	18	10N	61E	25 AUG 89	Never Drilled		
Nye	18	10N	61E	24 MAY 93	P & A	7,118	Oil
Nye	28	11N	60E	11 SEP 56	P & A	692	
Nye	10	5N	61E	09 JUL 84	Never Drilled		
Nye	11	5N	61E	09 JUL 84	Never Drilled		
Nye	14	5N	61E	07 OCT 02	Drilled		
Nye	33	5N	62E	02 JUL 98	P&A	4,447	Oil
Nye	33	5N	62E		Never Drilled		
Nye	5	8N	60E	19 MAY 70	P & A	800	
White Pine	3	13N	61E	09 JUL 84	Never Drilled		
White Pine	4	14N	61E	27 SEP 71	P & A	2,603	Water
White Pine	9	14N	61E	27 JAN 74	D & A	271	
White Pine	9	14N	61E	10 JUL 75	P & A	4,600	
White Pine	33	14N	61E	23 MAY 85	P & A	1,442	
White Pine	14	14N	61E	23 MAY 85	P & A	464	
White Pine	29	15N	61E	19 MAY 70	Never Drilled		
White Pine	29	16N	61E	21 OCT 93	P & A	7,356	
White Pine	16	19N	61E	19 MAY 70	P & A	712	
White Pine	21	19N	63E	30 NOV 77	P & A	4,407	Oil
White Pine	24	19N	63E	25 MAR 81	P & A	6,075	Oil
White Pine	36	19N	63E	12 DEC 94	P & A	7,810	

COUNTY	SEC	TOWN	RANGE	PERMIT ISSUED	STATUS*	DEPTH (FT)	SHOW
White Pine	17	19N	64E	16 SEP 65	P & A	6,100	
White Pine	21	19N	64E	03 MAR 03			
White Pine	27	20N	63E	30 NOV 77	P & A	9,263	
White Pine	16	23N	63E	12 JUL 79	P & A	6,444	
White Pine	19	24N	64E	03 FEB 76	P & A	8,406	
White Pine	17	24N	64E	09 JUL 84	P & A	11,700	Oil
White Pine	18	25N	64E	03 MAR 93			

*A = abandoned; D = drilled; P = plugged

5.3.4 Foreseeable Future Disturbances

Future disturbances to geology, topography, and minerals are quantified in **Table 5.1-3** above.

Community Development

Use of mineral products for the construction of roads, railroads, buildings and other facilities would likely continue in the future. Impacts from use of licensed gravel pits and other borrow sources are regulated and minimal.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Oil and gas wells, mines for various commodities, and other mineral resources would likely continue to be developed as their economic value increases.

Railroad Development

A borrow pit would be required to supply materials for the rehabilitation of the NNRy railroad grade. Acreages for borrow pits for the project have not been proposed as of the writing of this EIS. **Section 5.3.5** describes the estimated amount of ballast that would be required for construction of the Alternative Rail Line (approximately 700,000 tons). Since the NNRy grade already exists, it is assumed that substantially less ballast would be required to reconstruct the NNRy than to build an Alternative Rail Line from the ground up. These borrow sources would occur on private lands or within currently permitted BLM pits.

Utility Production and Distribution

As discussed in **Section 5.2.4** above, the construction and operation of the proposed White Pine Energy Station (WPES) would require borrow and other construction materials. WPES has proposed a borrow pit of approximately 40 acres in section 35, T22N, R63E, for either its Proposed Action or Alternative 1, which WPES considers a temporary disturbance (BLM 2007e). The WPES is likely to have a slight impact on topography through the filling of its proposed, on-site combustion waste landfill and other project features (BLM 2007e).

5.3.5 Cumulative Disturbances

During construction of the EEC and, to a smaller extent, during operations, borrow material and other mineral resources would be obtained from both on and off-site sources. The Proponents have roughly estimated the aggregate requirements for these purposes and believe all such materials could either be obtained from on-site borrow or private off-site sources. In the event that the Alternative Rail Line is constructed for conveying coal to the power plant site, an

estimated 700,000 tons of aggregate base material would be imported for sub-ballast from private sources within 100 miles of the site.

Another mineral commodity that would be used by the EEC is limestone for flue gas desulfurization. The plant would require 86,400 tons annually during operations (Crispin and Isaacson 2008). Limestone is abundant in the region.

As noted in **Section 2.2.1.3**, the EEC phase 1 would consume 22,000 tons of coal per day for the duration of operation, which is expected to be 50 years. WPES estimates its coal use at 22,500 tons per day (BLM 2007e). Both projects would import their coal resources from the Powder River Basin (PRB) in Wyoming by rail. PRB coal production in 2006 was 431.3 million tons, which is 1.2 million tons per day (BLM 2007k).

In addition, the EEC would consume bulk quantities of lubricating oil, locomotive fuel oil, diesel fuel, and gasoline in various project facilities and components. Other mineral resources would likely be consumed in smaller quantities through the life of the project.

The WPES and EEC would have a minimal effect on topography within the CEA through development of landfills, evaporation ponds, roads, and other facilities.

Within the CEA, known quantifiable past and present disturbances total approximately 111,232 acres. Proposed future disturbances would potentially disturb another 51,580 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to geology, topography and minerals within the CEA would be approximately 268,812 acres, which is approximately 16 percent of the total area of the CEA.

5.3.6 Cumulative Effects

The cumulative effects of the EEC on mineral and geological resources would be minimal, and its effect on topography would be negligible. No existing or foreseeable mining districts or petroleum products wells would be affected by the project, either directly or by affecting site access. On-site mineral resources (aggregate) and off-site, private sources of mineral materials are currently thought to be sufficient for the EEC project. The WPES has included a mineral materials source within its Proposed Action. A borrow source(s) for ballast and possibly other mineral materials would be required for the NNRy reconstruction. The quantities of mineral materials required for all these projects would be satisfied for each from current or new sources. At peak construction times for these projects, especially if these times overlap each other, the availability of such materials for other purposes could be limited in the local area.

5.4 Paleontological Resources

5.4.1 CEA Boundary

The CEA for Paleontological Resources would be the same as described for geology (**Figure 5.3-1**). This boundary encompasses 1,679,357 acres.

Rationale

Because the project should not affect paleontological resources outside of the direct effects area, this CEA was chosen mainly for simplicity purposes. Activities attached to the Proposed Action and Action Alternatives that might affect paleontological resources could occur outside of the actual disturbance area, but not likely outside of this proposed CEA.

5.4.2 Introduction

Southeastern Nevada has yielded paleontological resources that have contributed to our understanding of the development and history of life on earth. Many studies and research papers include discussions and analysis of these (Reynolds 2007a). Paleontological resources are subject to cumulative impacts via loss through both natural processes of erosion and weathering, and man-made disturbances.

Cumulative effects to paleontological resources occur through the incremental degradation of the resources from various impacts, which reduce the information and scientific research potential of the resources.

The past, present, and reasonable foreseeable future disturbances with cumulative impacts to paleontological resources discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.4.3 Past and Present Disturbances

The current land ownership and uses for (thus disturbances within) the paleontological resources CEA can be found in **Tables 5.1-1** and **5.1-2** above.

Recreation, Land Use, and Extractive Industry (mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

The primary activities/disturbances that have already affected paleontological resources in the CEA include off-highway vehicle use, recreational collecting, lands and realty management, and mining activities. Fossils have been and continue to be discovered during ground disturbances related to developments such as mining, oil and gas development, landfill development, quarrying, and other activities in the CEA. Natural processes such as soil erosion and rock weathering have also exposed fossils.

As discussed in **Section 3.3.3**, there are mining districts within or near the CEA (**Figure 3.3-4**). Also noted in **Section 3.3.3**, there are 26 active oil and gas leases and one geothermal lease within the CEA. All of these endeavors include ground disturbing activities related to exploration, development, and extraction that could encounter paleontological resources. Approximately 554 acres of quarrying/gravel pit disturbance are located within the CEA.

Roads, Utility Production, and Distribution

Roads, power lines, pipelines, and utility construction can impact near surface deposits of paleontological resources in general and possibly deeper deposits in areas that required excavation through landforms.

Vertebrate fossils such as dinosaurs, mammals, fishes, reptiles, and uncommon invertebrate fossils are collected by trained researchers under BLM permit. These remain public property and are placed in museums or other public institutions after they are studied. Although the resources are removed from their original context, the documentation adds to the body of knowledge about paleontological resources in the region. However, casual use and un-

permitted collection of fossils has contributed to the loss of the resource and its research potential and interpretation. The lack of regular site monitoring and public education about fossil collecting has led to illegal commercial collecting of trilobites and excessive unauthorized collection (BLM 2008a).

5.4.4 Foreseeable Future Disturbances

Future disturbances to paleontological resources are quantified in **Table 5.1-3** above. The reasonably foreseeable future actions all have the potential to impact paleontological resources. However, as much of the land in the CEA is publicly administered, these projects would all be subject to NEPA and federal and state regulations protecting paleontological resources.

Geological formations with exposures containing paleontological resources would continue to be impacted by natural agents (e.g., erosion, rock weathering, surface water drainage).

Community Development

Several proposed community development projects, including the Alamo land sale (376 acres), the Coyote Springs Development (43,000 acres), and the Hidden Valley Community Development (910 acres), have the potential to impact paleontological resources as well. Private development does not afford the same protections and standard operating procedures as activities under federal administration.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Any future mining development on public lands would require an inventory of paleontological resources, as well as documentation or collection of specimens uncovered during operations (BLM 2008a).

The White Pine & Grant-Quinn Oil & Gas Leasing program (USFS 2007c, 2007d) would lease up to 255,603 acres of National Forest System lands for oil and gas development, including exploration and possibly well development. A small portion of this falls within the paleontological resources CEA boundary.

Railroad Development

Rehabilitation of the NNRy would require minimal ground disturbance; however, improvements to segments of the NNRy that cross buried fine-grained Pleistocene sediments have the potential to impact paleontological resources below the surface. Further, the NNRy through Goshute Valley contacts gray lacustrine sediments of Pleistocene Lake Goshute that have the potential for paleontological resources at the surface (Reynolds 2007a).

Utility Production and Distribution

Ground disturbances related to the White Pine Energy Station, also in Steptoe Valley within the CEA, have the potential to expose/uncover significant fossils. The WPES plant site would disturb 1,281 acres of land while the associated proposed transmission ROWs would disturb an additional 621 acres.

Numerous linear developments, including the SWIP Corridor, BLM Utility Corridor, and the WWEC have been proposed through the CEA. These include new or expanded utility ROWs

for power transmission, water pipelines, roads (e.g., residential developments or access to other uses), fiber-optic, petroleum products, natural gas, and others (see **Appendix 5A**).

5.4.5 Cumulative Disturbances

Within the CEA for paleontological resources, known quantifiable past and present disturbances total approximately 26,400 acres. Proposed future disturbances would potentially disturb another 51,580 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to paleontological resources within the CEA would be approximately 183,980 acres, which is approximately 11 percent of the total area of the CEA.

5.4.6 Cumulative Effects

Encountering paleontological resources during development/disturbance has the potential to destroy and/or lose the resource. However, it also has the potential of providing additional data and rare or previously unknown specimens which can further scientific knowledge. Additional impacts to paleontological resources in conjunction with the EEC would not be known until discovered and evaluated. Impacts to paleontological resources associated with federal land management decisions/actions would be minimized or reduced in accordance with federal legislation and existing standard operating procedures. Thus, cumulative impacts to paleontological resources would be negligible to minor.

5.5 Soils

5.5.1 CEA Boundary

The CEA boundary for soils would be the same as described for surface water (**Figure 5.2-1**).

Rationale

This CEA boundary is the same as surface water due to the effect that soil disturbance has on surface water quality through erosion and sedimentation. Soil resources outside the watersheds for the Proposed Action and Action Alternatives would not be affected. The potentially affected drainages would include the Duck Creek Basin (within the Steptoe Valley Basin), the Goshute Valley Basin, and the White River Valley Basin.

5.5.2 Introduction

Section 3.5 details soil mapping units for the EEC project area within Steptoe Valley and depicts them on **Figure 3.5-1**. **Section 4.5** describes the impacts that would disturb soil resources and reduce their value or function for the short or long term. Prime farmland in the Lages Station Well Field would no longer be irrigated and would need to be stabilized from wind erosion. In other areas, very little soil disturbance would occur on steeper slopes that would increase erosion potential.

As noted in **Section 4.5**, disturbed soil loses its structure and porosity when disturbed through displacement or compaction by heavy equipment. Consequently, the soil is more prone to

erosion by water or wind and may be less able to support some kinds of vegetation (loss of productivity).

5.5.3 Past and Present Disturbances

The types of past and present disturbances that may affect soils in the CEA are the same as those described for surface water in **Section 5.2**. The current land ownership and uses for (thus disturbances within) the soils CEA would be the same as those described for surface water resources in **Tables 5.1-1** and **5.1-2** above.

5.5.4 Foreseeable Future Disturbances

The foreseeable future disturbances in the CEA that may affect soils are the same as those described for surface water in **Section 5.2**. Future disturbances to soils are quantified in **Table 5.1-3** above.

5.5.5 Cumulative Disturbances

The cumulative disturbances in the CEA that may affect soils are the same as those described for surface water in **Section 5.2**.

5.5.6 Cumulative Effects

Under the Proposed Action or the Action Alternatives, disturbance to soil resources would be minor to moderate during construction and negligible to minor post-construction. Use of BMPs during construction, and prompt post-construction reclamation at all facilities (plant, transmission lines, rail line, water production and conveyance, worker village), and management of the plant site for zero discharge of storm water assures that temporary soil disturbance would be of short duration and minimal impact. The same can be said of the WPES project and all proposed projects in or adjacent to the CEA, individually and cumulatively, based on current regulatory requirements for storm water permitting. The most likely source of moderate to severe impacts to soils in the CEA, short term or long term, is from wildfires, abandoned mines, and unrestricted use of OHVs (see **Section 5.2.3** and **Section 5.2.4**).

As discussed in **Section 4.5.2.4**, deposition of nitrogen and sulfur compounds from carbon fuel combustion sources can potentially cause changes in the chemistry of surficial soils exposed to this deposition. The emissions of this type from the EEC along with those of other combustion sources in the air quality CEA could pose potential cumulative effects on soils within this CEA. The cumulative effects of other COPCs in the emissions from both the EEC and WPES were modeled for the near field area and are discussed in the Risk Assessment narrative in **Section 5.6.**

5.6 Air Resources

5.6.1 CEA Boundary

The CEA for air quality is consistent with the area where EPA and NDEP required cumulative impact air quality modeling for the air permit application of the EEC. The CEA would include all Class I areas and FLMs identified sensitive Class II areas within a 300 km radius of the EEC. It also includes a 50 km radius beyond all locations with predicted significant contributions to air pollution levels in Class II areas.

For the EEC South Plant Site, the CEA would be a 93.8 kilometer radius (58.25 miles) around the facility plus the two Class I areas within 300 km (Jarbidge Wilderness and Zion National Park).

For the North Plant Site Alternative, the CEA would be a 95.3 kilometer (59.22 miles) around the facility plus the two Class I areas within 300 km and the FLMs designated sensitive Class II area, Great Basin National Park.

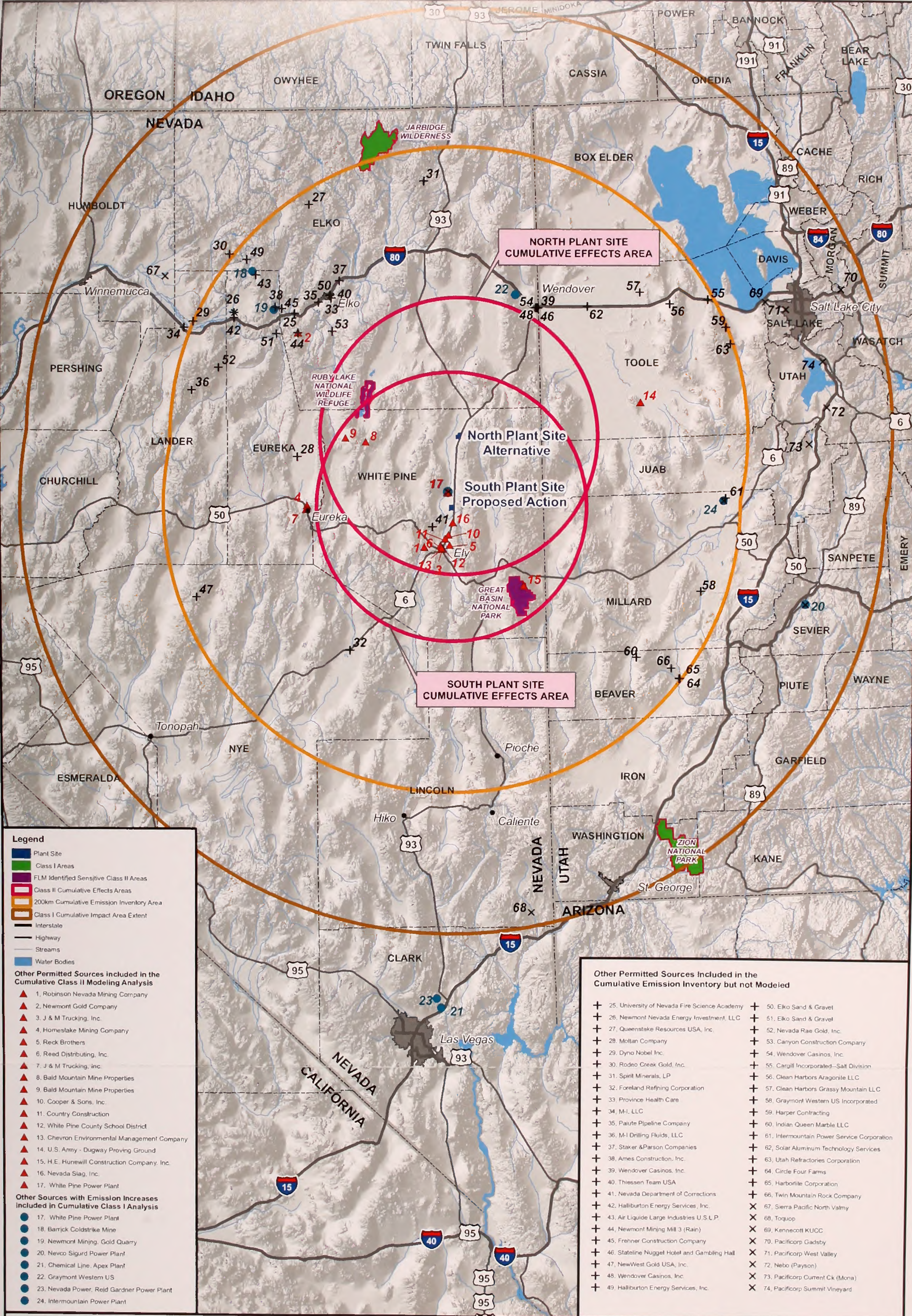
Rationale

Air pollutant emissions and direct impacts associated with the EEC project are compared with all federal and State air quality standards within the direct effects area. This cumulative effects analysis analyzes cumulative activities in and affecting the CEA for their potential effects on all applicable ambient air quality standards, documents potential cumulative degradation in ambient air pollutant concentrations and air quality related values (AQRVs), compares those impacts against allowable and accepted ranges, and provides quantitative risk assessment modeling to assess air pathway risks to the public from the proposed action and the foreseeable WPES. An inventory of all existing emission sources and foreseeable permitted major emission sources within 200 km of either proposed power plant site is also provided..

Figure 5.6-1 shows the CEA for the air quality analysis.

5.6.2 Introduction

Section 3.6 documents that air quality in Steptoe Valley and the CEA is generally better than the National and Nevada Ambient Air Quality Standards. Air pollutant measurements onsite at the proposed EEC location showed concentrations less than fifteen percent of those standards for all pollutants except ozone. Other regional monitoring results reported by NBAPC (current PM_{10} monitoring in Elko and Battle Mountain, historic PM_{10} monitoring in the Steptoe Valley) and the IMPROVE monitoring network (historic and ongoing PM_{10}, $PM_{2.5}$, and ozone monitoring) show air pollutant concentrations well below those air quality standards in local urban areas and pristine sensitive areas. Winter inversions occur in the area valleys, but activity levels are generally low enough that not enough air pollutants are emitted to lead to significant buildups of pollution levels as documented by air quality monitoring data collected at the proposed EEC plant sites. Dispersed air pollution sources in the CEA include emissions resulting from ranching and land management activities including agricultural burning, and disturbed soils to wildfires and prescribed burning. Regional haze studies including the recent Western Regional Air Partners (WRAP) regional haze modeling effort show impacts within acceptable ranges from large regional sources, including power plants. The results of those WRAP studies have included permit compliance follow-up at facilities shown to have the potential to adversely affect ambient air quality or limits on incremental degradation. Cumulative effects to air quality in the CEA from past, present, and foreseeable future activities from permitted industrial source of emissions are documented in this section. A qualitative assessment of other air pollution sources from the dispersed or non-permitted sources is also included to provide a comprehensive look at overall air quality emissions and impacts. Because the analysis of cumulative effects to air resources utilizes sources as prescribed by air permits and is largely quantitative, this section of the cumulative effects analysis will be structured somewhat differently than others.



Source - Base Map: ESRI and National Atlas of the United States

1:2,500,000

40 0 40 Miles

60 0 60 Kilometers

Scale is 1:2,500,000 when printed at 11"x17"

FIGURE 5.6-1
CUMULATIVE EFFECTS AREAS EXPLANATION
AIR RESOURCES
ELY ENERGY CENTER

5.6.3 Past and Present Disturbances

In Steptoe Valley, historic McGill operations, including the McGill Smelter operated by the Steptoe Valley Mining and Smelting Company, resulted in McGill and Steptoe Valley failing to meet SO_2 ambient air quality standards and being declared non-attainment for SO_2. The NNRy ran from Shafter to Ely, leading to some air quality impacts from diesel trains. The industrial activities in McGill, including the smelter, were closed down by 1990, bringing ambient concentrations of pollutants, including SO_2, in line with low regional background values. The railway was abandoned shortly thereafter. Those changes contributed to the current status of attainment with all applicable ambient air quality standards, including SO_2. EEC on-site measurements of ambient pollutant concentrations also show attainment, with measured concentrations of all criteria air pollutants except ozone an order of magnitude or more below the NAAQS and Nevada AAQS. The fourth maximum 8-hour average ozone concentrations measured onsite over one year of monitoring were 96 percent of the 8-hour average ozone NAAQS that applies to the average of three years of fourth maximum values, reasonably consistent with ozone concentration measurements regionally.

The mining industry has had a prominent role in the regional economy. In the immediate project vicinity that role included providing the raw materials to support the historic metal processing efforts in McGill. While overall volume of material mined in and immediately adjacent to Steptoe Valley is down since the closing of the McGill Smelter, there remain a number of mines operating in the CEA, including the Robinson Mine outside Ruth which continues to produce copper, silver, gold, and molybdenum. A number of larger mines operate around the CEA's perimeter, especially to the west and northwest toward the Carlin Trend. Dust is generated from winds over disturbed surfaces at closed mines, and from winds over surface disturbance and from mining activities at existing mines. That windborne dust could contain metals.

Regional population and development across the CEA historically and currently include regional air pollutant sources referred to as regional area sources. Few if any of those area sources have air quality permits. These sources include transportation related vehicle emissions along roadways and in the towns and cities, space heating emissions from residences and businesses, emissions associated with residential or business land management like dust generation from disturbed surfaces or small equipment exhaust, and any other small engine emissions or fossil fuel burning equipment. These sources also include smaller industrial emission sources like gas stations, vehicle maintenance facilities, and dry cleaners.

Emission Sources Included in Quantified Air Quality Modeling Analyses

An air quality modeling analysis was prepared for the NDEP air permit application to quantitatively assess ambient air quality impacts from current industrial sources in the CEA. The pollutants considered included all criteria air pollutants for which the proposed EEC potentially can have a significant contribution to air quality levels. In Class II areas, the three criteria air pollutants for which the air quality modeling has shown that EEC has the potential for significant contributions are NOx, PM_{10}, and SO_2. Cumulative air quality modeling analyses were prepared for those three pollutants to assess the Class II impacts from regional industrial sources with air permits. Consistent with EPA guidelines and requirements by the NDEP during air permit review, all industrial air pollutant sources with air quality permits (required for facilities above NDEP-defined significant emission thresholds) that emitted any of those three pollutants within 50 kilometers (31 miles) of where the EEC was predicted to have significant contributions to air quality levels were included in the cumulative impact modeling for the NDEP permit

application. **Table 5.6-1** documents the existing industrial sources included in the cumulative Class II modeling analyses, and the modeled emission rates consistent with their allowable potential emission rates. The cumulative impact analyses from the quantitative Class II air quality modeling include emissions from these identified industrial emission sources that have received an air permit.

Measured ambient air pollutant concentrations documented in **Section 3.6** were used as background values for the quantitative modeling analyses. Non-permitted air emissions sources potentially affect historic and current air quality in the CEA. Dust sources would include vegetation disturbing land management practices, including ranching; private and public grazing and agriculture; ground clearing in open lands and along utility corridors; road dust; smaller mining and rock crushing operations; recreational activities; and regional construction and maintenance efforts. Smoke is generated from agricultural burning, and wild and prescribed fires. Sources of gaseous air pollutants not requiring an air permit generally have low emission volumes individually, but could represent higher emission volumes cumulatively. Existing emission sources, permitted or non-permitted, were accounted for in the analysis consistent with actual activity levels during the air quality monitoring period, since the impact of their emissions was included in the background concentrations measured. Those sources include the regional area sources described above.

TABLE 5.6-1. EMISSION RATES FOR FACILITIES INCLUDED IN THE CLASS II AREA ANALYSIS

FIGURE 5.6-1 FACILITY NUMBER	FACILITY NAME	UTM E	UTM N	PERMITTED POTENTIAL TO EMIT (POUNDS PER HOUR)		
				PM10	NOX	SO2
1	Robinson Nevada Mining Company	671580	4347540	104.4	4.0	5.8
2	Newmont Gold Company	583930	4495990	7.9		
3	J & M Trucking, Inc.	684020	4346150	0.9		
4	Homestake Mining Company	589940	4376280	0.02		
5	Reck Brothers	689110	4348990	4.5	2.3	
6	Reed Distributing, Inc.	682780	4348580	0.005		
7	J & M Trucking, Inc.	589410	4373560	0.6		
8	Bald Mountain Mine Properties	630900	4420250	0.2		
9	Bald Mountain Mine Properties	617000	4423100	0.4	0.6	
10	Cooper & Sons, Inc.	688350	4356200	10.8	3.2	
11	Country Construction	685820	4353520	3.3		
12	White Pine County School District	684170	4346840	2.1	0.1	0.3
13	Chevron Environmental Management Company	683560	4347130		0.4	
14	U.S. Army - Dugway Proving Ground - Utah	820553	4448686			5.2
15	H. E. Hunewill Construction Co., Inc.	740760	4321140	107.5		86.6
16	Nevada Slag, Inc.	691300	4364600	14.3	2.4	

The modeling analysis of Class II cumulative air quality impacts also included the foreseeable sources within 50 kilometers of the maximum extent of the proposed EEC's area of predicted significant contribution documented in **Section 5.6.4** and **Table 5.6-6**, specifically the proposed WPES. The location of each source included in the Class II area cumulative air quality modeling analysis is identified in **Figure 5.6-1** by red triangle symbols.

The Class I direct impact analysis showed that the EEC could have impacts for one pollutant, SO_2, that exceed the Class I significant contribution threshold, as described in **Section 4.6**. As a result, EPA guidance and NDEP regulations required an analysis comparing cumulative impacts from the time of the PSD baseline dates (January 6, 1975 for major sources around Jarbidge Wilderness, and April 1, 1990 for major sources around Zion National Park, with "major source" defined as a source with permitted potential to emit of 250 tons per year) against incremental air quality degradation limits defined under the PSD program. The regional sources identified by NDEP as having increases in SO_2 emissions after those baseline dates within 300 kilometers of either Class I area, and therefore included in the Class I area cumulative impact analysis, are shown in **Table 5.6-2**.

The Class I modeling analysis provided quantified predictions of maximum increases in SO_2 impacts since the PSD baseline dates, for direct comparison against the applicable PSD impact limits.

TABLE 5.6-2. OPERATING REGIONAL CLASS I SO_2 INCREMENT CONSUMING EMISSION SOURCES MODELED

FIGURE 5.6-1 FACILITY NUMBER	FACILITY	LOCATION	EMISSION UNIT	SO2 EMISSIONS (LB/HR)
22	Graymont Western U.S.	Near Wendover, UT	Kiln 1	14.0
			Kiln 2	21.0
			Kiln 3	33.6
19	Newmont Mining, Gold Quarry	Near Battle Mountain, NV	Mill 6	27.4
			Preheaters	12.9
			Roasters	39.5
18	Barrick, Goldstrike Mine	Near Battle Mountain, NV	Mill 1	4.3
			Mill 2	4.3
			Roasting	44.9
			Agg. Dryer	10.6
23	Nevada Power, Reid Gardner	Northeast of Las Vegas, NV	Boiler #4	857.2
21	Chemical Lime, Apex Plant	Northeast of Las Vegas, NV	Kiln #4	127.7

The modeling analysis of Class I cumulative air quality impacts also included the foreseeable sources documented in **Section 5.6.4** and **Tables 5.6-5** and **5.6-6**, specifically two permitted but not yet built coal-fired power plant units in Utah and the proposed LS Power WPES. The location of each of the sources included in the Class I area cumulative air quality modeling analysis is shown in **Figure 5.6-1** as blue dots.

Emission Sources Qualitatively Addressed, Not Included in Quantified Air Quality Modeling Analyses

The emission sources not requiring individual air permits discussed in this section were not directly included as separate sources in the air quality modeling analysis. Their recent emissions during the one year that air quality monitoring was performed at each proposed energy center site were accounted for through the use of measured air pollutant concentrations

for background. That background data should be representative of actual emissions during the monitoring period, and their impacts in the vicinity of the proposed energy center sites. Any differences in actual air pollutant levels across the model domain during the monitoring period, or trends in emissions and their impacts in the future are not measured or measurable, and therefore will be addressed qualitatively.

For this EIS, an additional qualitative analysis of emission sources that may contribute to potential cumulative air quality impacts was prepared. Emissions data were gathered for all permitted industrial air pollution sources within 200 kilometers (124 miles) of either of the proposed EEC sites that had at least five tons per year of emissions of any criteria air pollutant. The resulting emission inventory, shown in **Tables 5.6-3** and **5.6-4**, gives a clear indication of industrial air emissions in a 200 kilometer radius around either EEC site, providing detailed coverage of the primary stationary air emission sources between the modeled Class II area in the vicinity of the proposed facility and the distant Class I areas for which impacts were analyzed. The sources and emissions listed in **Tables 5.6-3** and **5.6-4** represent an inventory of emissions in a 200 kilometer radius of either proposed energy center site. They were not included in the Class II area air quality modeling analysis unless they are also listed in **Tables 5.6-1** or **5.6-6**, and were only included in the Class I area impact analyses if they are listed in **Tables 5.6-2** or **5.6-5**. **Table 5.6-3** documents the currently permitted Nevada industrial sources within 200 kilometers of either potential EEC site identified from a comprehensive emission inventory provided by the NBAPC, and shows the potential to emit for each criteria air pollutant except lead. Greenhouse gas emissions were requested from the NDEP and UDAQ, but that information was not readily available. **Table 5.6-4** documents the currently permitted Utah industrial sources within 200 kilometers of either potential EEC site from a comprehensive emission inventory provided by the Utah Division of Air Quality (UDAQ). That table shows actual emissions reported by UDAQ, the higher of emissions reported for calendar year 2005 or 2006. The location of each permitted industrial air pollutant source included in the cumulative emission inventory can be seen on **Figure 5-6.1**.

TABLE 5.6-3. PERMITTED NEVADA AIR POLLUTION SOURCES*

UTM E	UTM N	FIG. 5.6-1 FAC. #	FACILITY NAME	FACILITY TYPE	PERMITTED POTENTIAL TO EMIT (TONS PER YEAR)				
					PM-10	NOX	SO2	CO	VOC
734420	4522850	22	Graymont Western Us, Inc	Class 1 PSD - Pilot Peak	2491.4	2102.4	300.5	5387.4	93.38
581610	4509370	25	University Of Nevada Fire Science Academy	Class 2 –Carlin	747.8	32.8	8.4	2032.8	923.9
539690	4510070	26	Newmont Nevada Energy Investment, LLC.	Class 1 PSD OPTC - Boulder Valley Power Proj.	597.0	0.1	334.6	1426.6	62.3
568120	4512620	19	Newmont Mining Corporation	Class 1 – Gold Quarry	548.9	248.7	354.4	277.7	64.7
554700	4536310	19	Barrick Goldstrike Mines, Inc	Class 1 - Goldstrike Mine	407.0	382.9	247.4	353.6	234.3
591760	4584600	27	Queenstake Resources Usa, Inc.	Class 1 - Jerrit Canyon Mine	171.9	203.7	89.4	119.1	3.1
583580	4410070	28	Moltan Company	Class 2	104.5	91.9	76.6	14.8	14.0
511310	4504090	29	Dyno Nobel Inc	Class 2 -Battle Mountain Facility	97.2	96.5	0.0	98.8	1.5
536800	4550500	30	Rodeo Creek Gold, Inc.	Class 1 - Hollister Block Development Project	1.9	76.1	13.1	21.4	5.6
583930	4495990	44	Newmont Mining Corporation	Class 2 – Mill 3 (Rain)	85.9	10.0	0.8	1.7	0.2
589940	4376280	4	Homestake Mining Company	Class 2 -Ruby Hill Project	73.8	0.0	0.0	0.0	0.0
670460	4600840	31	Spirit Minerals, Lp	Class 2	3.0	58.8	4.6	7.7	0.8
620240	4275540	32	Foreland Refining Corporation	Class 2 -Eagle Springs Refinery	11.5	0.0	0.0	0.0	48.5
606700	4520300	33	Province Health Care	Northeastern Nevada Regional Hospital	1.6	30.2	47.5	13.4	13.4
504870	4499868	34	M-I, LLC	Class 2 - Battle Mountain Grinding Plant	33.2	3.0	0.0	1.3	0.2
598150	4517340	35	Paiute Pipeline Company	Class 2 -Elko Station	0.3	25.4	0.0	3.1	1.0
510450	4456560	36	M-I Drilling Fluids, LLC.	Class 2 -Greystone Project	22.0	0.0	0.0	0.0	0.0
689110	4348990	5	Reck Brothers	Class 2	3.6	10.3	0.9	21.7	5.4
612400	4532100	37	Staker & Parson Companies	Class 2 –Osino	3.9	8.3	0.0	20.7	11.0
568250	4513800	38	Ames Construction, Inc.	Class 2 -Newmont Mining Project	14.2	19.8	5.6	0.5	6.8
749580	4513620	39	Wendover Casinos, Inc.	Class 2 -Montego Bay Casino Resort	0.5	18.4	0.3	2.5	0.4
605740	4521750	40	Thiessen Team USA	Class 2 -Elko Bagging Facility	17.1	13.1	0.0	11.0	0.4
677220	4361750	41	Nevada Department Of Corrections	Class 2 - Ely State Prison	0.5	5.0	16.0	1.3	0.1

UTM E	UTM N	FIG. 5.6-1 FAC. #	FACILITY NAME	FACILITY TYPE	PERMITTED POTENTIAL TO EMIT (TONS PER YEAR)				
					PM-10	NOX	SO2	CO	VOC
539610	4506700	42	Halliburton Energy Services, Inc	Class 2 -Dunphy Plant & Crusher	8.0	3.9	14.0	1.0	0.1
554600	4536000	43	Air Liquide Large Industries U.S. L.P.	Class 1a -Barrick Goldstrike Oxygen Plant	0.3	12.6	0.0	1.5	0.0
572650	4512740	45	Frehner Construction Company	Class 2 - Elko Airport Phase 3	3.0	12.3	0.9	10.8	4.3
749590	4513620	46	Stateline Nugget Hotel And Gambling Hall	Class 2	2.1	12.2	0.1	1.7	0.4
691300	4364600	16	Nevada Slag, Inc	Class 2	3.8	10.7	7.0	2.4	0.7
513370	4312190	47	NewWest Gold USA, Inc.	Class 2 -North Umberland Mine	0.7	10.0	0.7	2.2	0.8
747990	4513770	48	Wendover Casinos, Inc.	Class 2 - Rainbow Hotel Casino	0.3	9.8	0.1	1.3	0.2
548590	4546860	49	Halliburton Energy Services, Inc.	Class 2 - Rossi Jig Plant	8.4	0.0	0.0	0.0	0.0
606190	4522340	50	Elko Sand & Gravel	Class 2 -Elko Pit	1.1	8.3	0.5	1.8	0.7
569030	4495500	51	Elko Sand & Gravel	Class 2 -P. Pit	2.3	7.8	0.5	1.7	0.6
528890	4471900	52	Nevada Rae Gold, Inc	Class 2 -Crescent Valley Sluice Mining	7.3	0.0	0.0	0.0	0.0
607690	4497100	53	Canyon Construction Company	Class 2 - Spring Creek Rock Products	5.6	6.7	0.4	1.4	0.5
748730	4513830	54	Wendover Casinos, Inc.	Class 2 - Peppermill Hotel Casino	0.2	6.1	0.1	0.8	0.1

* Within 200 kilometers of either proposed site with a potential to emit of at least 5 tons per year of any criteria pollutant.

TABLE 5.6-4. PERMITTED UTAH AIR POLLUTION SOURCES*

UTM E	UTM N	FIG. 5.6-1 FAC. #	FACILITY NAME	FACILITY TYPE	PERMITTED POTENTIAL TO EMIT (TONS PER YEAR)					
					PM-10	PM-2.5	NOX	SO2	CO	VOCS
364239	4374448	61	Intermountain Power Service Corporation	Intermountain Generation Station	465.8	116.5	25406.4	4241.0	1484.2	14.6
343100	4311010	58	Graymont Western US Incorporated	Cricket Mountain Plant	236.7	140.8	1003.6	41.9	685.8	35.7
309300	4444300	14	Dugway Proving Ground	U.S. Army-Dugway Proving Ground	510.1	88.8	73.1	33.1	24.2	30.3
333812	4510930	56	Clean Harbors Aragonite LLC	Hazardous Waste Storage/Incineration	4.8	2.8	131.9	32.6	32.9	6.1
359960	4512180	55	Cargill Incorporated--Salt Division	Timpie Salt Processing Plant	53.1	53.1	48.8	3.9	17.5	3
320000	4258500	66	Twin Mountain Rock	Twin Mountain Rock	28.5	5.2	19.7	2.0	7.3	1.5
313700	4520000	57	Clean Harbors Grassy Mountain LLC	Grassy Mountain Landfill Facility	26.6	5.4	2.3	0.1	1.9	0.9
325570	4250830	64	Circle Four Farms	Circle Four Feedmill	15.5	7.9	2.6	0.02	2.2	0.1
296300	4267700	60	Indian Queen Marble LLC	Marble Mine	3.4	1.3	10.0	0.8	1.9	0.9
325000	4251000	65	Harborlite Corporation	Perlite Processing Plant	1.6	1.1	8.0	0.5	2.3	0.7
373637	4480896	63	Utah Refractories Corporation	Silica Stone Quarry	3.1	0.1	0.2	0	0.1	0
371220	4492360	59	Harper Contracting	Pit#23 Near Manila	1.4	1.4	0.3	0	0.1	0
276774	4512892	62	Solar Aluminum Technology Services	Aluminum Recovery Facility	0	0	0	0	0	0

*With actual 2005 or 2006 emissions of at least 5 tons per year of a criteria pollutant within 200 kilometers of either proposed site - sources with a potential to emit of at least 5 tons per year of any criteria pollutant.

UTM coordinates are UTM zone 12, which covers most of Utah, not zone 11 which covers most of Nevada including the proposed EEC site alternatives

Actual emissions (the maximum reported in 2005 or 2006) are reported here, in contrast to permitted potential to emit elsewhere in Chapters 4 and 5

5.6.4 Foreseeable Future Disturbances

Emission Sources Included in Quantified Air Quality Modeling Analyses

Quantitative air quality modeling analyses include emissions from all industrial emission sources that have received a draft or final air permit. Two foreseeable industrial activities, facilities with air permits that were not yet operating, are identified as major sources potentially capable of contributing to incremental air quality degradation in the Jarbidge Wilderness and/or Zion National Park Class I areas. Those sources were included in the modeling analyses to assess cumulative SO_2 air quality impacts. Their facility names and potential SO_2 emission rates are listed in **Table 5.6-5**.

TABLE 5.6-5. FORESEEABLE REGIONAL CLASS I SO_2 INCREMENT CONSUMING EMISSION SOURCES MODELED

FACILITY	FIGURE 5.6-1 FACILITY NUMBER	LOCATION	EMISSION UNIT	SO2 EMISSIONS (LB/HR)
Intermountain Power Plant	24	Near Delta, UT	Unit 3	905.0
Nevco Sigurd Power Plant	20	Sigurd, UT	S1	124.9

One project requiring an air permit was identified as foreseeable in the Class II CEA, the proposed WPES in Steptoe Valley. The allowable potential emissions from that facility's draft air permit were included in the cumulative air quality modeling analysis for the Class I and Class II impact areas. The WPES model sources for this analysis include all onsite emissions included in the WPES air permit application to NDEP. **Table 5.6-6** documents the cumulative emissions for the WPES modeled for the cumulative impacts analysis. As described for the Proposed Action's air permit air quality impact analysis, off-site emissions generated by the WPES project are not included in the modeling. They are addressed qualitatively later in this section.

TABLE 5.6-6. SOURCE EMISSION RATES FOR FORESEEABLE FACILITIES INCLUDED IN THE CLASS I AND CLASS II AREA ANALYSES

FACILITY NAME	FIGURE 5.6-1 FACILITY NUMBER	POLLUTANT	EMISSION RATE (LB/HR)	FACILITY UTM LOCATION (ME)	FACILITY UTM LOCATION (MN)
LS Power White Pine Energy Station	17	CO	2,367.5	690700	4399400
		NO_x	1,098.9		
		PM_{10}	626.5		
		SO_2	1,386.3		

Emission Sources Qualitatively Addressed, Not Included in Quantified Air Quality Modeling Analyses

Foreseeable new non-permitted emission sources, or changes from current emission patterns, are expected to include:

- growth in rail traffic once a rail link is established with this project and/or the WPES,
- potential local and regional growth in auto, truck, and air traffic,
- potential energy exploration and/or development,
- proposed mining ventures,

- range improvement and fire management efforts, and
- increases in ground disturbances from:
  - vegetation changes associated with grazing and agricultural activities,
  - under or along utility corridors, along fire breaks, and from construction efforts
- changes in emissions from non-permitted sources identified as currently existing.

5.6.5 Cumulative Disturbances

5.6.5.1 Currently Operating Emission Sources

Section 5.6.3 documents the currently operating permitted industrial sources identified as potentially affecting the CEA that were included in dispersion modeling analyses along with the EEC. Those sources are listed in **Table 5.6-1**. That section also lists, in **Tables 5.6-3** and **5.6-4** all existing permitted facilities in a 200 kilometer radius of the proposed EEC (either site). Only those sources in **Tables 5.6-3** and **5.6-4** that are also listed in **Table 5.6-1** were included in the air quality modeling analyses. The impacts of all other inventoried emissions documented in **Tables 5.6-3** and **5.6-4** are discussed qualitatively in this section.

The regional energy system includes a number of power plants surrounding the CEA. **Table 5.6-2** documents one existing power plant, the Reid Gardner 650MW coal-fired plant in Moapa that was included in the quantitative air quality modeling impact assessment. A review of all power plants within 300 kilometers of either proposed EEC plant site location shows eight currently operating facilities with permitted capacity of at least 100 MW, seven in Utah and one in Nevada. Only one of those facilities, the coal fired 1900 MW Intermountain Power Plant near Delta, Utah is within 200 kilometers and therefore included in the cumulative emission inventory and shown in **Table 5.6-4**. The other power plants with permitted capacities of 100 MW or greater within 300 kilometers of the proposed EEC plant sites are shown in **Table 5.6-7**.

TABLE 5.6-7. POWER PLANTS WITH AT LEAST 100 MW PERMITTED CAPACITY WITHIN 300KM OF EITHER PROPOSED EEC PLANT SITE

FACILITY	FIGURE 5.6-1 FACILITY NUMBER	LOCATION	FUEL	CAPACITY (MEGAWATTS)
Intermountain Power Plant	24	Near Delta, UT	Coal	1900
Pacificorp Summit Vineyard	71	Utah County, UT	Natural Gas	560
Pacificorp Current Creek (Mona)	73	Utah County, UT	Natural Gas	525
Sierra Pacific North Valmy	67	Valmy, Nevada	Coal	521
Pacificorp Gadsby	70	Summit County, UT	Natural Gas, Oil	380.5
Pacificorp West Valley	71	Salt Lake County, UT	Natural Gas	217
Kennecott KUCC	69	Salt Lake County, UT	Coal, Natural Gas	175
Utah Associated Municipal Power System Nebo (Payson)	72	Utah County, UT	Natural Gas	141

The emissions and impacts from all other existing regional power plants with emissions over 250 TPY of any air pollutant were included in the recent Western Regional Air Partnership (WRAP) modeling to assess potential air pollutant and regional haze impacts. That study included requirements for Best Available Retrofit Technology (BART) for any facility determined to have excess impacts in any Class I area. Other operational power plants that were distant

enough that their emissions were not directly included as point sources in the EEC's quantitative air quality impact analysis include:

- the 2400 MW coal-fired Four Corners Generating Station in Fruitland, NM,
- the 2250 MW coal-fired Navajo Generating Station outside Page, AZ,
- the 1800 MW coal-fired San Juan Generating Station outside Farmington, NM,
- three Pacificorp coal fired power plants in Utah not far beyond 300 kilometers from the proposed EEC plant sites: the 1112 MW Huntington plant, the 895 MW Hunter plant, and the 172 MW Carbon plant,
- four natural gas fired generating stations with a combined capacity of 2406 MW in the Apex Valley north of Las Vegas,
- two Pacificorp coal fired power plants in southeastern Wyoming: the 1413 MW Jim Bridger plant and the 700 MW Naughton plant,
- the 380 MW coal-fired Pacificorp Cholla facility in northeast Arizona,
- the 250 MW Escalante Generating Station northwest of Grants, NM,
- the 75 MW natural gas fired Harry Allen peaking power plant in Clark County, NV, and,
- a 51 MW plant in Broomfield owned and operated by the city of Farmington, NM.

The impacts (if any) of those power plants and all other sources of air pollutants existing during the September 2006 to August 2007 EEC onsite air quality monitoring period were included in the EEC impact analysis by way of the background ambient air concentrations.

Oil and gas exploration and extraction are established industries to the east and northeast of the CEA in Utah, Wyoming, the Four Corners area, and points beyond. Leasing activity has not occurred in Steptoe Valley, and is in the planning stage in areas on the western and northern fringes of the CEA.

The Nevada mining industry set an all time record for total value of mined commodities in 2006. There are currently at least eleven mines active or open in White Pine County (Driesner and Coyner 2007). The most significant producers are the Barrick Bald Mountain Mine in far western White Pine County, on a ridgetop two to three ranges to the west of Steptoe Valley, and the Robinson Mine outside Ruth. At least nine other smaller mines exist and are, or could be, active in the county. Outside the CEA, large mining operations exist that could impact the CEA. Most are identified on **Figure 5.6-1**. Those mines include the following, listed with 2006 production totals:

- Seven mines were operational in Elko County to the north, including the Queenstake Jerritt Canyon that was recently closed, the Barrick Goldstrike, and the Newmont Midas that each produced over 100,000 ounces of gold.
- To the northwest in northern Eureka County, the Barrick Goldstrike Betze-Post and Newmont Mining Eastern Nevada Operations each produced over one million ounces of gold.
- To the west in Lander County, the Battle Mountain Greystone Mine produced nearly 300,000 tons of barite and the Cortez Gold Mine produced over 400,000 ounces of gold.
- Farther north in Lander County, the Newmont Mining Mule Canyon Mine and Phoenix Project produced copper, gold, and silver near Battle Mountain.

- To the southwest in Nye County, Round Mountain Gold's Smoky Valley Common Operations produced over 600,000 ounces of gold and silver.

Wildfires and prescribed fires have historically affected the majority of forested and range lands in the CEA, the region, and most of the Western U.S. Agricultural development has changed the fire cycle where it has taken hold, and introduced agricultural burning, which has historically produced only a small percentage of the smoke generated on undeveloped lands. Fire has always been a part of the ecological cycle in this dry climate, and it will continue to be in the future. After decades of aggressive fire suppression in the mid-20th century, public land management efforts in recent decades generally try to minimize large magnitude smoke generation from large acreage wildfires by using prescribed burning and other techniques to control fuel accumulations. Those efforts do not change the long term volume of smoke and air pollutants generated, but they even out the distribution over time and minimize the high level exposures during fires that can have the most significant effects on public health.

Regionally distributed land use and land management choices affect regional air quality trends. Dust and vehicle exhaust emissions are generated from ranching operations which represent a prominent portion of land use and economic activity in Steptoe Valley. Similarly, management decisions on public and private lands, including vegetation management, construction, maintenance and use of roadways, and fire breaks affect vegetation patterns and the potential for dust generation. Utility corridors, including power transmission line corridors, gas and water pipelines, and fiber optic cable lines, can generate dust, especially where corridor access roads are open to public use and vegetation is managed or removed to maintain those corridors. Construction efforts to prepare or maintain activities throughout the CEA are also sources of dust generation and exhaust emissions.

Other regionally distributed contributors to air quality trends are area source emissions associated with transportation, residential and industrial space heating, and other household and small service industry activities associated with population density. All paved highways are sources of exhaust emissions from vehicles, and some dust generation as well. Unpaved roads generate considerably more dust from the roadbed materials. US-93 serves as a main artery north and south through Steptoe Valley. It runs approximately 1 mile east of the proposed EEC plant sites. US-50 also crosses east to west through the southern Steptoe Valley, traversing through Ely and then west toward Ruth via Robinson Summit. US-6 runs from Ely south. Numerous paved and unpaved roads in and around Steptoe Valley and in surrounding areas in the CEA facilitate local travel patterns. In the vicinity of the EEC, traffic volumes from 1996 to 2005 on US-93 have averaged about 3,000 vehicles per day south of McGill, with an upward trend north of McGill. Traffic volumes on Cherry Creek Road just west of US-93 have fluctuated from 50 to 60 vehicles per day during that period (HDR et al. 2007). The Ely airport features air and ground operations that generate exhaust and other air pollutant emissions. Commercial rail traffic and associated train exhaust and dust emissions have been limited to the UPRR line to the north since the NNRy ceased operation. Limited (recreational) rail operations on the southern portion of the NNRy near Ely have occurred recently. Space heating associated with occupied buildings, including residential, public, and private ownerships occur throughout the CEA consistent with population and development patterns. Those emissions, and others, like home, yard and street maintenance, are most concentrated in the few areas with population density in the CEA. The most notable areas where those types of emissions are concentrated are the cities of Ely and McGill. The same effect occurs, to a lesser extent, in the other smaller communities in and around Steptoe Valley.

The impacts of all existing air pollutant sources were included in the monitoring data from the proposed EEC sites used to determine background concentrations for the quantitative analysis. All recent local and regional NDEP air quality monitoring data showed particulate levels less than 60 percent of applicable NAAQS standards and ambient SO_2 concentrations orders of magnitude below applicable NAAQS standards. Those monitoring results, and the fact that the entire CEA is designated as attainment or unclassified for all pollutants, indicate that with current activity levels, air quality throughout the CEA does not approach any ambient air quality standards. Except in the immediate vicinity of the generally low volume emission sources identified, air pollutant concentrations, other than ozone seasonally during the warm weather season, are shown by measurements at the EEC to be typically an order of magnitude below applicable national and Nevada ambient air quality standards. Nowhere in the CEA is known to approach any applicable ambient air quality standard.

5.6.5.2 Foreseeable New Emission Sources, and Trends Anticipated For Emissions from Existing Emission Sources or Source Categories

Section 5.6.4 documents the permitted industrial sources identified as foreseeable potentially affecting the CEA that were included in dispersion modeling analyses along with the EEC. That section also documents a number of other foreseeable actions not included in the air quality modeling analyses that could have actual or potential impacts on air quality in the CEA. The nature of those foreseeable actions and their actual or potential air emissions are discussed below. Impacts associated with those actions are discussed in **Section 5.6.6**, Cumulative Effects.

The regional energy system is expected to retain most or all existing generating capacity in the foreseeable future. New nearby power supply facilities are also planned. **Table 5.6-3** (Newmont Gold), **5.6-5,** and **5.6-6** (White Pine Energy Station) document four foreseeable coal-fired power plant projects that have received draft or final air permits. The emissions from those four sources were included in the quantitative air quality impact modeling analyses. The 200 MW coal and oil fired Newmont Gold plant is scheduled to begin operating in 2008. The proposed 1600 MW coal-fired WPES has an air permit and is in the process of completing the NEPA permitting. The air permits for both Utah plants, the 270 MW coal-fired Nevco Sigurd Power Plant near Sigurd and 950 MW coal-fired Unit 3 at the Intermountain Power Project near Delta, were issued, but both permits are under appeal. Construction has not yet begun on either of those planned facilities. Foreseeable power plant projects not included in the quantitative air quality modeling analyses include the proposed 750 MW coal-fired Toquop Energy project 12 miles northwest of Mesquite, NV within 300 kilometers; the more distant proposed 1500 MW Desert Rock Energy Project 30 miles southwest of Farmington, NM, and the proposed 300 MW Mustang Energy Project near Grants, NM. The Desert Rock and Toquop projects are progressing through the latter stages of air permitting and through the NEPA process. One source included in the quantitative modeling, the Reid Gardner Moapa area plant included in the Class I modeling, could be scaled back as a result of the Proposed Action. Any such decrease from that facility in the future could offset some of the new emissions from sources mentioned in this paragraph.

Current planning efforts appear likely to result in public land leases for oil and gas exploration to the CEA and its vicinity. A Record of Decision in August 2007 approved the White Pine and Quinn Oil and Gas leasing projects authorizing exploratory drilling on USFS lands west of Steptoe Valley in western White Pine, eastern Nye, and eastern Lincoln counties. A similar action is planned by the Elko District of the BLM. Successful exploration efforts could lead to energy field development in the future. Air emission estimates are speculative at this time

because the volume of activity is unknown, though the energy recovery rates are expected to be modest in comparison to developed western fields further east in the Rocky Mountain region.

Mining is expected to remain a strong and vibrant part of the regional economy. The operating mines hope to maintain the production pace that resulted in record production volumes in 2006 (the last year comprehensive statistics were available). Six proposed mines in Nye County have either just completed their permitting and approval process or anticipate final decisions by 2008. The Barrick Bald Mountain Mine in western White Pine County is anticipating a final decision on its planned expansion in 2008. The larger regional mines have documented their emissions and impact estimates through air permitting programs.

Fire will continue to represent an important and ever-present part of the ecological cycle in the CEA. Public land management efforts are expected to continue to try to minimize large magnitude smoke generation from big wildfires by using prescribed burning and other techniques to control fuel accumulations. That effort would not be expected to change the long-term volume of smoke and air pollutants generated much, but would even the distribution of smoke and combustion by-products out over time and minimize the high uncontrolled exposures that can have the most significant effects on public health. Specific current plans include the Sacramento Pass Hazardous Fuels Reduction Project to the east, the Toano Fuel Break Project along I-80 and SR-223 to the north, and the fuel reduction portions of the Spruce Mountain Restoration Project south of Wells.

Ranching and agricultural activities are expected to remain near current levels, likely dropping off a little as a percentage of land use over time. Public and private lands management planning could affect dust generation directly or via changes in vegetation strength and density. Grazing management plans indicate trends toward maintaining or possibly gradually decreasing grazing rates for livestock, wild horses, and wildlife. Vegetation management and road building efforts, including the fuel break and Spruce Mountain Projects already mentioned, are anticipated to result in a slight trend toward increases in disturbed ground and dust generation. Utility corridor maintenance and expansion, including proposed water projects and numerous planned or approved utility corridors, would have the same effect. Construction efforts to prepare or maintain improvements throughout the CEA would also represent a source of dust generation and exhaust emissions that should increase gradually consistent with the level of regional activity and development.

Regional traffic and population rates are expected to receive a boost as a result of construction and to a lesser extent during the operational phase for the proposed EEC, and possibly from the proposed WPES as well. Employment opportunities in the mining industry are currently strong. Employment statistics show a steady increase in employment in White Pine County and surrounding areas from a low in the 1990s, which coinciding with a cyclic downturn in the mining industry. Employment trends show a shift in concentration toward government and service sectors. New development projects, including power plants, and the increased electrical supply would expand the employment base for the area and maintain the light upward trend in employment. Overall, the trend in emissions from space heating and residential activity is expected to remain stable or decrease slightly. Emission reductions from population decreases and improved heating efficiency could be offset somewhat by industrial expansion. Traffic projections prepared from Nevada Department of Transportation data and employment and economic trend data estimate that current traffic volumes on US-93 and Cherry Creek Road would increase by approximately one third per decade in the future. The total traffic volume predicted in 2030 would be a little more than twice the traffic volumes on US-93 north and south of McGill and on Cherry Creek Road (HDR et al. 2007). Vehicle exhaust emissions from those

traffic increases are expected to remain steady or decrease slightly, with improved efficiency and emission controls offsetting increased volume. Road dust emissions would be expected to increase proportionally to traffic volume increases.

The potential reestablishment of the NNRy service to and from Steptoe Valley would provide a boost to regional infrastructure, and also could stimulate the economy. Numerous planned highway improvement projects would maintain and strengthen the road network. Emissions of air pollutants from rail traffic, with train engines powered by diesel, from Shafter on the UPRR line to the north, would add train engine diesel exhaust and would return a historic source of emissions to the valley. Emissions from trains serving the EEC are documented in **Section 4.6**. Train traffic volume or track mileage covered to serve other sites in Steptoe Valley once service is established could occur. Rail traffic volumes would be difficult to predict for any other source than the proposed WPES. The WPES DEIS predicts rail traffic and exhaust emissions similar to those forecasted for the Proposed Action.

A cumulative evaluation of railway transport emissions would also include engine emissions along the full length of transport, from the coal mine to the EEC, though the act of mining the coal effectively ensures transport to the final user or distribution center. A number of coal sources are being considered. Given availability and transport practicalities, the most likely source of most of the coal for the project is expected to be the PRB in Wyoming. The Antelope Mine there was considered conservatively representative as a source of coal. Estimates of engine emissions from 1.35 trains per day over the 985 mile train route from the Antelope Mine to the UPRR line and along that line to Shafter are shown in **Table 5.6-8**. This table includes the Shafter to EEC emissions documented in **Section 4.6**.

TABLE 5.6-8. EMISSION RATES (TONS/YEAR) FROM COAL TRAIN ENGINES FROM MINE SOURCE TO PROPOSED EEC SITES

POLLUTANT	VOLATILE ORGANIC COMPOUNDS (VOCS)	CO	NO_X	PM	SO_2
South Plant Site	235.2	940.9	3164.8	192.5	249.7
North Plant Site Alternative	226.2	904.7	3043.0	185.0	240.1

Emission factors from EPA 420-F-97-048 emission factor (g/bhp-hr)

Uses EPA AP-42 Table 3.4-1 emission factor for S from large diesel engines, assumes 0.25% S content in fuel

5.6.6 Cumulative Effects

This section documents ambient air quality impacts of the Proposed Action and other existing or foreseeable activities in the CEA. For each Action Alternative, the predicted cumulative impacts of all foreseeable permitted industrial activities are presented quantitatively in terms of potential impacts on Class I areas and FLMs identified sensitive class II areas, and their impacts, including risks to human and ecological health, on Class II areas. Current and foreseeable emission sources not included in the quantitative modeling analyses are described above. Potential impacts from current and foreseeable emission sources not included in the quantitative modeling analyses are described qualitatively.

5.6.6.1 Ambient Air Quality Impacts With the South Plant Site

Class I Area and FLM Identified Sensitive Class II Area Impacts

The WRAP BART study included emissions from all major sources of SO_2 in a modeling analysis, documenting impacts from all regional large source permitted emissions as of 2005 and requiring retrofitted emission control enhancements for all sources that were shown to have excess impacts in Class I areas. That analysis, and historic air quality regionally and from the IMPROVE monitoring system in Class I areas show that all applicable ambient air quality standards are met in the Class I areas studied in the CEA, the Jarbidge Wilderness and Zion National Park.

<u>Quantitative Cumulative Air Quality Modeling Impact Analyses.</u>

The PSD program sets a regulatory limit on air quality degradation after a baseline date set by the dates a major source permit application was declared complete in the affected region. **Section 5.6.3** above documents that direct impact modeling results described in **Section 4.6** showed potential EEC impacts in the Class I areas reaching Class I significant contribution thresholds for only one pollutant, SO_2. Cumulative Class I criteria pollutant impact modeling, therefore, was limited to that one pollutant. The federal and state PSD programs limit degradation in air quality since baseline dates set by timing of air permit issuance. The baseline date for major SO_2 sources (sources with greater than 250 tons per year of emissions) in Nevada was set in January 1975. The minor source SO_2 baseline date (for sources emitting less than 250 tons per year) in the vicinity of Zion National Park, one of the two Class I areas for which the cumulative impact analysis was prepared, was set in April 1990. No permitting action has yet set a minor source baseline date for the area surrounding the Jarbidge Wilderness in Nevada, though the Jarbidge area is included in the statewide major source baseline area.

Air quality modeling for cumulative Class I area SO_2 impacts and increment consumption was prepared for all increases in emissions from permitted industrial sources after the baseline dates (major and minor sources for Zion National Park, major sources for Jarbidge Wilderness) within 300 kilometers of either facility consistent with requirements and guidance from the NBAPC. **Tables 5.6-2**, **5.6-5**, and **5.6-6** document the regional PSD SO_2 increment consuming sources included in the cumulative Class I impact modeling analysis. Those sources and their locations are also identified in **Figure 5.6-1**.

Table 5.6-9 compares the model predicted maximum cumulative SO_2 increment consumption since the baseline date against the applicable PSD increment limits at the two Class I areas in the CEA.

TABLE 5.6-9. EEC SOUTH PLANT SITE CUMULATIVE SO_2 CLASS I PSD INCREMENT IMPACTS

POLLUTANT	AVERAGING PERIOD	MODELED CONCENTRATION FOR METEOROLOGICAL YEAR (MG/M^3)			PSD INCREMENT LIMIT
		2002	2003	2004	
JARBIDGE WA					
SO_2	3 hours	3.51	6.73	4.02	25
	24 hours	0.75	0.98	0.90	5
	Annual	0.03	0.9[illegible]	0.9[illegible]	2
ZION NP					
SO_2	3 hours	1.42	2.81	3.22	25
	24 hours	0.55	0.49	0.56	5
	Annual	0.04	0.04	0.04	2

The tables show that the maximum incremental degradation of SO_2 since the PSD baseline dates, calculated consistent with NBAPC requirements and guidance, is well under half the allowable increment limit for all averaging periods at each Class I area in the CEA.

Section 4.6 documents that visibility impacts from the Proposed Action are within ranges deemed acceptable by FLAG, and acid deposition rates are within BLM recommended thresholds. Air quality modeling documented above shows compliance with all applicable air pollutant concentration limits in all Class I and Class II areas in the CEA.

Section 4.6 documents that the modeled acid deposition rates and visibility impacts associated with the EEC in Class I areas are below Class I screening levels. Cumulative SO_2 impacts from the EEC and other PSD regional sources are well within acceptable impact ranges. The EEC's impacts in the FLM-identified sensitive Class II areas, Ruby Lake National Wildlife Refuge and Great Basin National Park, are documented. Visibility impacts from the Proposed Action at the sensitive Class II areas are shown to exceed the thresholds recommended and enforceable for Class I areas by FLAG. The methodologies employed are considered appropriate for visibility impact analyses in Class II areas as well as Class I areas, but federal and state legislation and air permitting regulations provide direct methods for enforcing those visibility impact thresholds in Class I areas that are not as well defined for Class II areas.

Impacts from Foreseeable Actions Not Included in Quantitative Modeling

Monitoring data in **Section 3.6** shows current trends for AQRV parameters visibility and acid deposition have been fairly steady, and criteria air pollutant levels are quite low in the Steptoe Valley and surrounding areas and slightly higher impacts in the more developed areas due to local activity. Proposed regional actions, including the White Pine Energy Station and the Toquop Energy Project have prepared analyses similar to the criteria pollutant and AQRV analyses provided here for the proposed action, meeting their regulatory requirements to demonstrate AQRV impacts within those same thresholds. Cumulative impacts on deposition and visibility from all foreseeable projects could exceed the impacts of any individual project, but would not be expected to reach double the predicted impacts of any individual project due to their spatial distribution. The National Park Service has noted that the three percent increase in deposition rates predicted from the Proposed Action would bring total nitrogen wet deposition to approximately 1.39 kg/ha-yr. NPS research in Great Basin National Park consistent with FLAG

guidance for determining critical load has indicated that soils there are acid sensitive. They note that adverse effects from acid deposition were observed at Rocky Mountain National Park's high mountain lake ecosystems when deposition rates there reached rates of 1.4 to 1.6 kg/ha-yr. The NPS is concerned that acid deposition from any new or increased regional emission source in addition to the proposed action could result in acidification of soils and waterways potentially detrimental to Great Basin National Park's high mountain lake ecosystems.

There is the possibility of some impacts in the two Class I areas from sources other than specific industrial activity that would not be included in the modeling. Regional or urban growth, cumulative impacts from current and foreseeable small industrial operations, and increases in regional traffic could cause increased fossil fuel burning that would increase regional SO_2 concentrations. The Jarbidge Wilderness Class I area is located at considerably higher elevations than surrounding areas, and is remote from any concentrated local or regional emission sources. That remoteness would likely buffer the Jarbidge Wilderness from significant impacts, but not from any possible impact. There are few existing or proposed emissions sources upwind of Zion National Park in the direction of the proposed EEC, though on trajectories with a more east-west orientation the proposed Toquop Energy project and the fast growing cities of southern Nevada and Utah not included in the Class I modeling analyses could contribute to incremental degradation in SO_2 air quality levels.

Land management decisions, including fire and vegetation management, grazing and agriculture, are also likely to have limited impact on air quality over the long term, though some such management efforts, especially those related to fire management, could have noticeable short term effects. Trends toward increased particulate levels are possible as a result of increased wind erosion, though planning for ecological integrity should minimize those possibilities.

Class II Area Impacts

<u>Quantitative Air Quality Modeling Impact Analyses</u>

Cumulative impact analyses were prepared for the three criteria air pollutants for which the direct impact of the proposed EEC resulted in contributions to air pollutant levels; PM_{10}, NO_2, and SO_2. The Class II cumulative air quality modeling analysis added model predicted maximum impacts of the modeled industrial sources associated with the proposed EEC and those of the identified sources identified in **Tables 5.6-1** and **5.6-6** to background concentrations based upon maximum measured air pollutant concentrations at the EEC sites. Those air quality measurements included the effects at the EEC sites of all existing emission sources during the monitoring period.

To compare maximum ambient air pollutant levels with the EEC and all other foreseeable activities operating requires adding three components: the impacts of emissions from the proposed EEC; the impact of emissions from all other air pollutant sources within 50km or the EEC Class II area of significant contribution that are permitted or currently have complete air permit applications being processed by the NDEP; and background concentrations to reflect the impacts of current activities not reflected in the specific modeled emission sources. The data used for each component is described earlier in this section. The cumulative modeling analysis predicted maximum impacts from the first two components; those resulting from emissions from the EEC and from all other modeled emission sources. Background concentrations measured at the South Plant Site were added to those model predicted maximum impacts to estimate the maximum predicted ambient air quality levels with all those sources operating. **Table 5.6-10**

documents the maximum predicted ambient air pollutant concentrations under Maximum Total Concentration. Two results are shown for each pollutant and averaging period: one for modeling with the Ely National Weather Service meteorological data, and one with meteorological data collected at the EEC sites starting in September, 2006. The reported Maximum Total Concentration represents the sum of the impacts from all modeled industrial sources (Cumulative Highest Modeled Concentration, also reported separately for analyses with the two meteorological data sets) and the background concentration. Maximum air quality impacts from all industrial sites modeled is listed under Cumulative Highest Modeled Concentration.

TABLE 5.6-10. NEVADA AAQS MODELING RESULTS FOR THE EEC SOUTH PLANT SITE

POLLUTANT	AVERAGING PERIOD	CUMULATIVE HIGHEST MODELED CONCENTRATION (µG/M3)		BACKGROUND CONCENTRATION (µG/M3)	MAXIMUM TOTAL CONCENTRATION (µG/M3)		NAAQS, NEVADA AAQS(A) (µG/M3)
		EEC ON-SITE MET. DATA	ELY NWS MET. DATA		EEC ON-SITE MET. DATA	ELY NWS MET. DATA	
NO_2	Annual	4.5[b][c]	3.4	3.7	8.2	7.1	100
SO_2	3 hours	295[c]	311	4.0	299	315	1,300
	24 hours	34.3[c]	39.7	3.0	37.3	42.7	365
	Annual	8.9[c]	4.8	3.0	11.9	7.8	80
PM_{10}	24 hours	32.2[c]	21.3	19.0	51.2	72.2	150
	Annual	8.9[c]	3.8	7.0	15.9	10.8	50

a NAAQS and Nevada AAQS are identical in magnitude. Short-term national standards allow one exceedance per calendar year. Short term values are 1st-highest in accordance with NDEP policy.

b The NOx to NO_2 conversion factor of 0.75 was applied.

c The receptor exhibiting maximum impact for this averaging period was directly adjacent to (and possibly within) the Nevada Slag site and did not exhibit a significant contribution from the EEC facility. It was therefore not included in the results.

The modeling results show predicted maximum ambient air quality levels compared to the Nevada AAQS and the NAAQS for all pollutants. The predicted maximum total concentration for each pollutant and averaging period can be seen from **Table 5.6-10** to be less than the applicable NAAQS.

Incremental degradation in ambient air quality was modeled for the three pollutants for which the facility was shown (in **Section 4.6**) to have potential areas of significant contributions to ambient air quality levels: NOx, PM_{10}, and SO_2 in Class II areas. The extended CEA and the emission sources included are described earlier in this section, and those emission sources are listed in **Tables 5.6-1** and **5.6-6**. The maximum cumulative incremental degradation at any point in the CEA is documented in **Table 5.6-11** under the cumulative PSD increment consumption header. Those results are directly comparable to the Class II area PSD increment limit. Model predicted results are again reported for model runs with two different meteorological data sets, data collected onsite at the proposed EEC site and data from the National Weather Service station at Ely's Yelland airport.

Model results show that modeled cumulative Class II area air quality degradation does not closely approach the PSD increment limits.

TABLE 5.6-11. PSD CLASS II AREA INCREMENT CONSUMPTION MODELING RESULTS FOR THE EEC SOUTH PLANT SITE

POLLUTANT	AVERAGING PERIOD	CUMULATIVE PSD INCREMENT CONSUMPTION (μG/M³)(A)		PSD INCREMENT LIMIT (μG/M³)
		MODELING ANALYSIS USING EEC ON-SITE MET. DATA	MODELING ANALYSIS USING ELY NWS MET. DATA	
NO_2	Annual	4.2(b)(c)	3.4(b)(c)	25
SO_2	3 hours	253(c)	279(c)	512
	24 hours	27.4(c)	20.6(c)	91
	Annual	4.8(c)	4.8(c)	20
PM_{10}	24 hours	27.6(c)	14.9(c)	30
	Annual	9.9(c)	3.8(c)	17

a Value represents the highest modeled impact within the significant impact area and outside the EEC fence line (second highest value for short-term averages)

b The NO_x to NO_2 conversion factor of 0.75 was applied.

c The receptor exhibiting maximum impact for this averaging period was directly adjacent to (and possibly within) the Nevada Slag site and did not exhibit a significant contribution from the EEC facility. It was therefore not included in the results.

Quantitative Risk Assessment modeling documents human and ecological risk associated with the combined emissions of the proposed EEC and the proposed WPES would be within recommended safe ranges at all locations within 50 kilometers of the proposed EEC. Cumulative risks associated with mercury emissions from coal-fired energy sources in Steptoe Valley would decrease with increased distance from the proposed EEC sites, since deposition rates decrease beyond that range would be lower than those in the Risk Assessment study area.

<u>Impacts from Foreseeable Actions Not Included in Quantitative Modeling</u>

The only impacts potentially foreseeable in the future not included in either of the reported modeling results would be increases in emissions or background concentrations as a result of increased emissions from sources other than permitted industrial sources modeled. Pollutant concentrations measured at the proposed EEC site show levels an order of magnitude under applicable ambient air quality standards. Emissions from space heating and residential activity are expected to be steady or slightly downward, with efficiency improvements meeting or exceeding increases in the number of individual units. Vehicle exhaust emissions from road and air traffic are expected to remain steady, with increases in miles traveled offset by increased efficiency in miles per gallon and/or emissions per volume of fuel consumed. A peak in emissions from residential, space heating, and transmission sources would likely occur during construction of the EEC and/or the WPES and the associated rail line support, probably not lasting more than a year or two nor increasing regional emissions and having only local air quality impacts. Road dust would be expected to increase slightly. Emissions, primarily dust and

smoke, from land management activities including construction, public land management, grazing, agriculture, and utility corridor maintenance, are expected to be flat or trend slightly upward over time. Those emission trends would be expected to maintain average regional background concentrations an order of magnitude below applicable ambient air quality standards. Isolated areas in the immediate vicinity of sources, or brief periods like during fires or dust storms, could feature air quality impacts above significant contribution thresholds. Foreseeable distant major sources, including the power plants listed, have demonstrated through their NEPA analyses their areas of significant contribution to air quality levels and AQRV impacts, and have performed analyses to document cumulative impacts on air quality and AQRVs in those areas. Air quality permitting and compliance programs would ensure that impacts from other smaller industrial sources not included in the quantitative modeling, including small mines and rock and gravel operations, would have limited localized areas of significant contributions to air pollutant levels and not affect compliance with applicable ambient air quality impact standards.

Rail line traffic was not included in the quantitative air quality modeling results described. **Table 5.6-8** documents cumulative train engine emissions along the rail line from the coal source to the proposed EEC site. Air quality impacts along the UPRR rail line en route from the mine to Shafter generally reach significant contribution thresholds local to the tracks due to current traffic volumes. The 1.3 train round-trips per day forecast as a result of the EEC would not represent a significant increase in rail traffic volume or impacts along the UPRR lines. From Shafter to the EEC, **Section 4.6** documented that significant effects to air quality were expected within 100 yards of the tracks, occasionally over slightly larger areas, where terrain would tend to concentrate train engine emissions. An indirect effect of the EEC project, the establishment of regular rail service from the UPRR in Shafter down to the proposed EEC site, could lead to significant contributions to air pollutant levels in a corridor up to ¼ mile wide along that stretch of tracks if the rail line operators were able to expand traffic volume by offering the rail service to other local or regional businesses.

Ambient air quality impacts would be expected to continue to trend toward moderate levels in the few urban areas along primary transportation routes, or in the immediate vicinity of the few small business operating in the area from those activities not included in the air quality modeling.

Risk Assessment

The risk assessment methodology and results for the EEC South Plant Site are described in **Section 4.6** and **Appendix 4A**. In addition to modeling potential risks associated with the operation of the EEC South Plant Site alone, Tetra Tech (2008) also evaluated effects of the operation of the EEC South Plant Site in conjunction with the WPES out to 50 kilometers. Emissions for WPES combustions sources were obtained from the WPES PSD permit application (Tetra Tech 2008). HHRA and SLERA methodology was the same as for the EEC plant sites, with the addition of the WPES emissions.

Human Risk

Nine modeled receptors showed excess cancer risks of at least 1 in 1 million (10^{-6}) as a result of the combined operations of the two energy centers. None of the risks exceeded 10^{-5}, and all were well within the 10^{-4} to 10^{-6} range recommended by EPA. The receptors with predicted risks over 1 in 1 million included a subsistence fisherman fishing in Duck Creek, and subsistence farmer adults and children in the near vicinity of the South Plant Site.

Total Hazard and Acute Hazard quotients were below the recommended safety threshold of 1 for all receptors studied. The infant risk from breast milk was estimated using ADD_{infant} as 6.8 pg/kg, well below the EPA recommended safety threshold of 93 pg/kg. Lead concentrations in soil as a result of deposition of emissions from the energy centers were predicted to be a million times lower than the 400 mg/kg soil concentration EPA recommends as a threshold for residential properties.

Ecological Risk

HQ and HI values for the SLERA were less than 1 for all receptors for the maximum potential effect cumulative scenario involving operation of all three EEC boilers and the WPES boilers simultaneously. Because all HQ and HI values are less than 1, no adverse cumulative effects on ecological communities as a result of the operation of the EEC and WPES are anticipated.

5.6.6.2 Ambient Air Quality Impacts for the North Plant Site Alternative

Class I Area and FLM Identified Sensitive Class II Area Impacts

Quantitative Air Quality Modeling Impact Analyses

Section 5.6.6.1 above for the EEC South Plant Site describes the process for identifying sources to be considered, and how they were used to assess cumulative Class I area SO_2 impacts. That description and the same list of sources identified applies for the North Plant Site as well.

Section 4.6 showed that the impacts of the North Plant Site Alternative would represent a significant contribution to ambient air quality levels for SO_2 only. For the other PSD pollutants, PM_{10} and NO_2, projected impacts would be below significant contribution levels. **Table 5.6-12** shows that the maximum incremental degradation of SO_2 since the PSD baseline dates is well under half the allowable increment limit for all averaging periods at each Class I area, so cumulative air quality impacts since the PSD baseline dates set by permitting authorities are far from the PSD limits for cumulative degradation.

Section 4.6 documents that AQRV impacts from the North Plant Site Alternative, including acid deposition and visibility impacts, are within allowable ranges recommended by BLM based upon consultation with FLMs.

TABLE 5.6-12. NORTH PLANT SITE ALTERNATIVE CUMULATIVE SO2 CLASS I PSD INCREMENT IMPACTS

POLLUTANT	AVERAGING PERIOD	MODELED CONCENTRATION FOR METEOROLOGICAL YEAR (MG/M^3)			PSD INCREMENT LIMIT
		2002	2003	2004	
JARBIDGE WA					
SO_2	3 hours	5.00	9.63	5.24	25
	24 hours	0.91	1.22	1.02	5
	Annual	0.04	0.04	0.05	2
ZION NP					
SO_2	3 hours	2.11	2.15	2.38	25
	24 hours	0.56	0.53	0.52	5
	Annual	0.04	0.04	0.04	2

Impacts from Foreseeable Actions Not Included in Quantitative Modeling

The potential for cumulative non-industrial impacts for the North Plant Site Alternative is consistent with the discussion offered for the South Plant Site. The only differences would be those described under indirect impacts in **Section 4.6**; the project rail line emissions would end 34 miles further north, and traffic and residential and support activities associated with the EEC site would be further north.

Class II Area Impacts

Class II area impact assessment modeling methodology for the North Plant Site Alternative is consistent with that described for the South Plant Site.

Quantitative Air Quality Modeling Impact Analyses

Table 5.6-12 documents the maximum predicted ambient air pollutant concentrations under Total Concentration. Two results are shown for each pollutant and averaging period; one for modeling with the Ely National Weather Service meteorological data, and one with meteorological data collected onsite starting in September 2006. The reported Total Concentration represents the sum of the impacts from all modeled industrial sources (Cumulative Highest Modeled Concentration, also reported separately for analyses with the two meteorological data sets) and the measured background concentration.

The modeling results show predicted maximum impacts directly comparable to the NAAQS and Nevada AAQS for all pollutants except ozone. The predicted maximum total concentration for each pollutant and averaging period can be seen from **Table 5.6-13** to be less than the applicable NAAQS.

TABLE 5.6-13. NEVADA AAQS MODELING RESULTS FOR THE EEC NORTH PLANT SITE ALTERNATIVE

POLLUTANT	AVERAGING PERIOD	CUMULATIVE HIGHEST MODELED CONCENTRATION (μG/M³)		BACKGROUND CONCENTRATION (μG/M³)	TOTAL CONCENTRATION (μG/M³)		NEVADA AAQS[A] (μG/M³)
		EEC ON-SITE MET. DATA	ELY NWS MET. DATA		EEC ON-SITE MET. DATA	ELY NWS MET. DATA	
NO_2	Annual	7.2[b]	20.3[b]	2.0	9.2	22.3	100
SO_2	3 hours	130	415	13.0	143	428	1,300
	24 hours	22.1	18.6	12.0	34.1	30.6	365
	Annual	3.0	1.5	6.5	9.5	8.0	80
PM_{10}	24 hours	25.9	22.8	8.1	34.0	30.9	150
	Annual	6.8	5.2	2.4	9.2	7.6	50

a National and Nevada AAQS are identical in magnitude. Short-term national standards allow one exceedance per calendar year. Short term values are 1st-highest in accordance with NDEP policy.

b The NO_x to NO_2 conversion factor of 0.75 was applied.

Incremental degradation of Class II ambient air quality was modeled for the three pollutants for which the facility was shown (in **Section 4.6**) to have significant contributions to air pollutant levels: NOx, PM_{10}, and SO_2. The extended CEA and the emission sources included have been previously described. The maximum cumulative incremental degradation at any point in the CEA for the North Plant Site Alternative is documented in **Table 5.6-14** under the cumulative PSD increment consumption header. Model predicted results are again reported for model runs with two different meteorological data sets, data collected onsite at the proposed EEC site and data from the National Weather Service station at Ely's Yelland airport.

TABLE 5.6-14. PSD CLASS II AREA INCREMENT CONSUMPTION MODELING RESULTS FOR THE EEC NORTH PLANT SITE ALTERNATIVE

POLLUTANT	AVERAGING PERIOD	CUMULATIVE PSD INCREMENT CONSUMPTION (μG/M^3)$^{(A)}$		PSD INCREMENT (μG/M^3)
		EEC ON-SITE MET. DATA	ELY NWS MET. DATA	
NO_2	Annual	7.2$^{(b)}$	20.3	25
SO_2	3 hours	64	252	512
	24 hours	10.8	10.8	91
	Annual	3.0	1.5	20
PM_{10}	24 hours	20.2	14.8	30
	Annual	6.8	5.2	17

a Value represents the highest modeled impact within the significant impact area and outside the EEC fence line (second highest value for short-term averages)

b The NO_x to NO_2 conversion factor of 0.75 was applied.

Model results show that cumulative air quality degradation after the baseline date does not closely approach the PSD increment limits.

Risk assessment modeling was performed for the North Plant Site Alternative as described for the South Plant Site. The discussion of AQRV impacts under the South Plant Site is valid for the North Plant Site Alternative, for which parallel modeling analyses provided comparable results using the same methodology.

Impacts from Foreseeable Actions Not Included in Quantitative Modeling

The discussion of the impacts of foreseeable air pollution sources not included in quantitative air quality modeling provided for the South Plant Site would be valid for the North Plant Site Alternative, with limited exceptions associated with differences in the location of actions of the proposed energy center. **Section 4.6** describes the differences in impacts with the EEC located at the North Plant Site Alternative rather than the South Plant Site. Those differences include a rail line approximately 34 miles shorter from Shafter and no project rail line emissions south of there; and differences in likely traffic patterns and employee residential locations. Those differences might result in slight differences in location of some of the subsequent growth and associated air quality impacts expected below significant contribution levels, but would not be expected to have much noticeable difference in regional air quality impacts or air pollution concentration trends. If the rail line ends further north under this alternative, and it is not extended south by any other party, the area between the North Plant Site Alternative and the

preferred South Plant Site would not see the train engine emissions and impacts described under the South Plant Site.

Risk Assessment

A cumulative analysis of the risk of combined operations of the proposed EEC and the proposed WPES was prepared for receptors out to 50 kilometers from the North Plant Site, as described for the South Plant Site.

Human Health Risk

Nine modeled receptors showed excess cancer risks of at least 1 in 1 million (10^{-6}) as a result of the combined operations of the two energy centers. None of the risks exceeded 10^{-5}, and all were well within the 10^{-4} to 10^{-6} range recommended by EPA. The receptors with predicted risks over 1 in 1 million included a subsistence fisherman living and fishing in the near vicinity of the North Plant Site, and subsistence farmer adults and children in the near vicinity of the North Plant Site.

Total Hazard quotients were below the recommended safety threshold of 1 for all receptors studied. The acute inhalation hazard quotient exceeded the screening threshold of 1 only at the maximally exposed location, which is unoccupied at present, and only in the unlikely scenario of simultaneous full operations of all main and auxiliary boilers. The infant risk from breast milk was estimated using ADD_{infant} as 2.7 pg/kg, well below the EPA recommended safety threshold of 93 pg/kg. Lead concentrations in soil as a result of deposition from energy facility operations were predicted to be more than a million times lower than the 400 mg/kg soil concentration EPA recommends as a threshold for residential properties.

Ecological Risk

HQ and HI values for the SLERA were less than 1 for all receptors for the maximum potential effect cumulative scenario involving operation of all three EEC boilers and the WPES boilers simultaneously. Because all HQ and HI values are less than 1, no adverse cumulative effects on ecological communities as a result of the operation of the EEC and WPES are anticipated.

5.7 Vegetation, Including Noxious and Non-native, Invasive Weeds and Special Status Plants

5.7.1 CEA Boundary

The CEA boundary for vegetation would be the same as described for surface water (**Section 5.2**).

Rationale

In addition to adopting a similar CEA for simplicity purposes, vegetation can be removed and affected by ground disturbances, which leads to habitat conversion and makes soil more susceptible to erosion, potentially contributing sediment to surface waters. The soil disturbance areas described previously to delineate the soil CEA boundaries would have associated vegetation disturbances. Cumulative vegetation impacts as a result of the project should not be noticeable beyond this area.

5.7.2 Introduction

Figure 5.2-1 depicts the CEA for vegetation. The CEA for vegetation includes nearly 2 million acres in the Central Basin and Range and Mojave Basin and Range ecoregions (EPA 2008). Data on land cover for the CEA for vegetation were obtained from the BLM landcover dataset (BLM 2007i). Fifty-six land cover types defined in the Nevada GAP data are represented within the CEA for vegetation. To facilitate analysis of land cover, and to better correlate the data with project-specific data presented in **Sections 3.7.4** and **4.7**, the 56 land cover types were condensed into 11 categories based on methodology provided within Nevada's Wildlife Action Plan (NDOW 2006). **Table 5.7-1** indicates the acreage of various types of land cover within the CEA and correlates the land cover types with the project-specific data presented in Chapters 3 and 4.

TABLE 5.7-1. LAND COVER ACREAGES FOUND WITHIN THE CEA FOR VEGETATION

LAND COVER CATEGORIES	VEGETATIVE COMMUNITIES WITHIN PROJECT AREA	LAND COVER ACREAGE WITHIN CEA
Agriculture	Agriculture	4,658
Barren Lands	N/A	9,956
Developed/Disturbed (includes medium and low density development, sand and gravel pits; does not include existing utility line development)	Disturbed Lands	918
Basins & Desert Scrub	Creosote Bush	725,595
	Greasewood	
	Joshua Tree	
	Salt Desert Shrub	
	Shadscale	
Lower Montane	Blackbrush	341,438
	Limestone Outcrop	
	Mountain Big Sagebrush	
	Pinyon-Juniper Woodland	
Montane to Alpine	N/A	19,221
Sagebrush Semi-desert	Basin Big Sagebrush	843,849
	Black Sagebrush	
	Douglas Rabbitbrush	
	Rubber Rabbitbrush	
	Winterfat	
	Wyoming Sagebrush	
Sand Dunes & Badlands	Dune	29,721
Riparian/Wetlands	Alkaline Meadow	13,849
	Desert Playa	
	Open Water	
	Riparian	
	Wetland	
Burned Areas	Burn/Fire Affected	86,734
Invasives[1]	N/A	3,530

[1]Acreage of invasives derived from the nv04_ReGap.mdb file from the BLM, which is based on the southwest regional GPA analysis, and represents gross infested acres.

Areas of sagebrush semi-desert, the land cover type with the greatest number of acres within the CEA for vegetation, are found within Steptoe Valley and the proposed utility ROW extending

south of Steptoe Valley into northern Lincoln County. Areas of basins and desert scrub vegetation, the second most prominent land cover type, are found in the central portion of Steptoe Valley, the proposed railroad ROW extending north from Steptoe Valley to Shafter, and the utility lines through most of Lincoln and Clark counties. Areas of lower montane vegetation are found within the proposed transmission facilities ROWs.

Historically, ecosystem process and vegetative cover were altered by grazing practices and development of the West. Present and future disturbance of vegetation in the CEA occurs primarily through activities related to grazing, followed by development of utility lines, roads and railroad lines, and extractive industries (mining and oil/gas exploration). The most extensive land use within the CEA is grazing.

The extent of special status plant species within the CEA for vegetation is unknown. The USFWS developed a biological sensitivity index and analysis of trust resources on BLM grazing allotments in Nevada (USFWS 2003). According to this analysis, none of the grazing allotments within the CEA for vegetation contain any plants with designations under the ESA. **Table 5.7-2** details the State sensitive species with a Global and State Rank, defined by the Nevada Natural Heritage Program (NNHP), found within grazing allotments in the CEA for vegetation.

TABLE 5.7-2. NNHP STATE SENSITIVE SPECIES FOUND ON GRAZING ALLOTMENTS WITHIN THE CEA FOR VEGETATION

SPECIES SCIENTIFIC NAME	SPECIES COMMON NAME	ALLOTMENT(S) WHERE FOUND	GLOBAL AND STATE RANK
Eriogonum phoeniceum	Scarlet Buckwheat	Wilson Creek	G1 S1
Mentzelia argillicola	Pioche Blazingstar	Wilson Creek	G1Q S1
Mentzelia tiehmii	Tiehm Blazingstar	Wilson Creek	G1G2 S1S2
Frasera gypsicola	Sunnyside Green Gentian	Sunnyside	G1 S1

Source: USFWS 2003

The past, present and future disturbances with cumulative impacts to vegetation discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.7.3 Past and Present Disturbances

Development of the West changed vegetative conditions through historic grazing practices, activities that altered natural hydrology, introduction and transportation of invasive and exotic species, and fire suppression. The combination of these led to establishment and prolific expansion of invasive and exotic species, such as cheatgrass (*Bromus tectorum* L.). Changes in vegetative cover in conjunction with fire suppression led to further changes that favored invasive and exotic species over native vegetative cover. Widespread changes in vegetative cover changed the fire regime and enhanced the effects of uncontrolled fire (Young and Blank 1995). Together these effects have altered ecosystems processes and vegetative cover within the CEA.

The current land ownership and uses for (thus disturbances within) the vegetation CEA can be found in **Tables 5.1-1** and **5.1-2** above.

Vegetation

Agriculture, Forestry, and Similar Sources of Surface Disturbance

Burning of over 68,000 acres in the CEA (nearly 4.5 percent) changes the maturity of an area's vegetation, can affect the vegetative composition of an area, and can result in the spread of noxious and non-native, invasive weeds with disturbance in addition to the burn.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

No data is available estimating the total acreage of disturbance from the extractive industry within the CEA. Extractive industry disturbance has caused long-term disturbance to vegetation because the extractive process, including use of roads, is long-term. Various degrees of reclamation, either man-made or natural, have resulted in various levels of revegetation of these disturbances. Increased use of roads can lead to transportation of noxious and non-native, invasive weeds into disturbed areas.

The tailings piles (approximately 3,700 acres) of the McGill Tailings Reclamation Area (see **Section 5.2.3**) were capped with a layer of topsoil and seeded with grasses native to the area. The revegetated area is irrigated annually May through September and is used for commercial grazing. While the grasses used in the revegetation effort are native to the area, the revegetated area does not represent a natural vegetation scheme due to the water received through irrigation (Kennecott Corporation Undated).

Development of 565 acres of sand and gravel pits in the CEA resulted in direct disturbance and elimination of areas of vegetation, approximately 0.03 percent of the CEA. Without rehabilitation efforts, vegetative recovery in former pit areas is a long-term process as soils have been removed and substrate will not support reestablishment of vegetation. In addition, disturbed areas associated with sand and gravel pits provide an opportunity for the spread of noxious and non-native, invasive weeds.

Grazing

The major past and present disturbance of vegetation in the CEA is due to grazing. Nearly 1.8 million acres of the nearly 2 million acre CEA (approximately 91 percent) is available for grazing. The majority of the CEA is enclosed within various BLM administered grazing allotments. Livestock grazing has utilized and continues to utilize the grass/forb species, reducing competition for natural regeneration of tree/shrub species. In addition, grazing activities can result in specific, localized damage in riparian areas from vegetation removal by cattle as well as increasing the introduction and spread of noxious and non-native vegetation species.

Some allotments within the vegetation CEA have been found to have substandard conditions, such as adversely impacted vegetative cover and riparian areas, most of which were created by historic grazing practices. Substandard conditions resulted in modifications to grazing management in order to achieve improvements in range conditions (BLM 2007b, BLM 2007c, and BLM 2007d).

Nearly 70,000 acres within the CEA lie within the Desert NWR and Pahranagat NWR. This area is not included within grazing allotments, thus vegetation should not experience effects from livestock grazing. In addition, under the Ely BLM District RMP (2007a), BLM public lands west of U.S. US-93, in the vicinity of the Desert NWR are not open for grazing. Lands within the Desert and Pahranagat NWRs consist predominantly of basins and desert scrub. The southern portion

of the CEA that falls within the Desert NWR contains some isolated areas of sand dunes and badlands.

Industrial Development

Apex Industrial Park, located at the southern tip of the CEA, is within an area of basins and desert scrub. An unknown portion of the 21,000-acre park is currently developed, therefore actual disturbance to vegetative communities is unknown. It is assumed that within the industrial park that development would result in vegetation removal and construction of structures, roads, and other hardened surfaces.

Roads

In addition to nearly 3,500 miles of roads in the CEA impacting vegetation permanently or in the long-term, roads have associated adverse effects on vegetation. In the case of large expanses of sparsely vegetated unfenced public lands (such as BLM lands), roads can beget other roads. Some people drive off road to access an area they want to reach. In desert climates, soil disturbances from vehicles and desert vegetation are slow to recover, and attract future additional vehicle use. Disturbed areas are much more likely to become infested with noxious and non-native, invasive weeds, and vehicles tend to spread seed from these species.

Utility Production and Distribution

The Harry Allen complex is located in an area consisting of basins and desert scrub vegetation. Power generation facilities and towers supporting associated transmission lines have a permanent adverse affect on vegetation, as existing vegetation has been replaced by structures. Placement of existing water supply lines and fiber optic cable within utility ROWs also has resulted in vegetation disturbances. However, because there are little or no surface facilities associated with these buried lines, there would be minimal permanent impacts.

Electric utility disturbance (Harry Allen complex, natural gas lines, Lincoln County, and NPC transmission lines) in the southern part of the CEA would have had a short-term minor impact on basins and desert scrub vegetation. Other utility development disturbance (for example, the Falcon to Gonder transmission line, and the Silver State East fiber optic line) has taken place within areas of sagebrush semi-desert vegetation, but this is much more limited in extent.

Noxious and Non-native, Invasive Weeds

Noxious and non-native, invasive weeds are prolific in areas of past disturbance, such as the intersection of State Highway 486 and US-93, and along White Pine County Road 27 (a heavily traveled dirt road) in the vicinity of Bassett Lake (see **Figure 3.7-1**). Populations of noxious and non-native, invasive weeds are infrequent in disturbance areas which are outside of drainages, washes, or generally not near moist environments.. Estimated total acreage for invasive species within the CEA is approximately 3,530 acres.

Special Status Plants

Past disturbances to special status plant species are unknown; however, because few to no special status plant species were found within the project area, it is unlikely that populations were significantly disturbed by past or present activities within the CEA.

Summary

Previously disturbed areas represent a measurable, but small proportion of the total CEA. In addition to temporarily and/or permanently reducing vegetation in the CEA, past and present disturbances also result in introduction and increased susceptibility for the establishment of noxious and non-native, invasive weeds. Past and present disturbances to special status plant species are unknown, but assumed to be minimal.

5.7.4 Foreseeable Future Disturbances

Future disturbances to vegetation are quantified in **Table 5.1-3** above.

Vegetation

Agriculture, Forestry, and Similar Sources of Surface Disturbance

The planned fire break in the Spruce Mountain Restoration Project disturbing approximately 16,000 acres of vegetation would have a short-term adverse impact from destruction of vegetation. However, the fire break would have indirect long-term beneficial impacts by protecting vegetation from the effects of fire.

Community Development

Ultimately, approximately 43,000 acres (Las Vegas Review-Journal 2007a) of basins and desert scrub vegetation would be disturbed in the Coyote Springs community development and likely replaced with roads, sports fields, structures (homes and other community infrastructure), and non-native vegetation (lawn grasses and ornamental shrubs and trees).

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities (mining or oil/gas development) is possible in the future. At this time, all known plans are for exploration, which would involve some road construction and drilling in selected areas. Expansion of extractive industries exploration activities would have negligible adverse impacts on vegetation in the CEA. However, should economic feasibility of resource development improve in the future, adverse impacts to vegetation would increase in acreage as well as intensity.

Vegetation at the McGill Tailings Reclamation Area will presumably continue to be sustained at present levels as a result of the current irrigation and commercial grazing management regime.

Grazing

Grazing on public lands would continue within the CEA in the foreseeable future. Per the Ely RMP, the goal is to manage vegetation resources to achieve or maintain resistant and resilient ecological conditions while providing for sustainable multiple uses and options for the future across the landscape. These resistant and resilient ecological conditions include healthy, productive, and diverse populations of native or desirable nonnative plant species appropriate to site characteristics. In addition, the RMP specifies goals and objectives to meet range health standards, which are directly related to vegetative cover.

Future range health would be anticipated to improve. Under the Ely RMP, the BLM will continue to monitor and evaluate allotments to determine if they are continuing to meet or are making significant progress to meeting the standards for rangeland health, and management prescriptions adjusted accordingly.

As discussed in **Section 5.9**, changes to the livestock grazing management systems are proposed to improve the overall management of livestock on certain allotments, and updates to the allotment management plans would help to meet the objectives of the allotments. Future changes to grazing management on these allotments would be designed to improve range conditions, which would also result in improvements to vegetative communities.

Industrial Development

Of the 21,000 acres within the Apex Industrial Park, 6,000 acres are currently for sale and available for future development. As stated previously, it is assumed that development would result in construction of structures and other hardened surfaces, and removal of native basins and desert scrub vegetation.

Railroad Development

Reconstruction of the NNRy would result in disturbance of approximately 2,600 acres of vegetation. Indirect effects related to the reconstruction of the NNRy include temporary construction disturbance within the existing ROW, primarily to sagebrush semi-desert land cover. Worker camps, materials staging, and grading would potentially disturb vegetation along the railway. These areas would be revegetated upon completion of construction.

In the area of the proposed Yucca Mountain rail line, approximately 600 acres of vegetation would be disturbed within the CEA (less that 0.001 percent). This vegetation is a mixture of basins and desert scrub and sagebrush semi-desert land cover communities.

Recreation

Increased human recreational activity on arid lands from an expected population increase in White Pine County would result in increased disturbed areas, which could lead to infestations of noxious and non-native, invasive weeds, or increased erosion which would further decrease vegetative cover, adversely impacting vegetative resources.

Roads

Roads disturb a total of nearly 20,000 acres (approximately one percent) within the CEA for vegetation. Future short-term disturbance to vegetation would result from road rehabilitation efforts within the CEA. Adverse effects to vegetation would result from damage to and/or removal of vegetation within the construction zone, and the likely subsequent invasion of noxious and non-native, invasive weeds into the disturbed area.

Utility Production and Distribution

Several proposed projects within the CEA would develop electric transmission and water transport through pipelines to be located within the utilities corridor in White Pine, Lincoln, and Clark Counties (see **Section 5.2.4**). Should the entire SWIP Corridor be maximized with underground water, petroleum or natural gas pipelines, the entire 2,640-foot wide utility corridor would be disturbed; however, there would be little permanent vegetative disturbance. Maximizing the corridor with overhead transmission lines would result in the greatest permanent disturbance of vegetation. Because this area consists primarily of basins and desert scrub, adverse impacts to vegetation would be anticipated to be mostly short-term as grasses and smaller shrubs regenerate. Larger species (such as Joshua trees) would sustain longer-term effects.

Utilization of the SWIP Corridor for a combination of transmission lines and underground pipelines would be most likely, resulting in a combination of short-term and long-term disturbance. It is possible that the entirety of the corridor would not be developed. Construction ROWs can be revegetated; however, disturbance has high potential to lead to the incursion of noxious and non-native, invasive weeds.

As discussed in **Section 5.7.3**, land cover within the proposed utility ROW portion of the CEA for vegetation is primarily either basins and desert scrub or sagebrush semi-desert. Development along the length of the SWIP Corridor within the CEA would impact both vegetation types. Impacts to basins and desert scrub vegetation from disturbance would likely be short-term as the native vegetation would be more likely to reestablish in 10 years or less after disturbance. Impacts to sagebrush semi-desert vegetation would be long-term as many of the larger species of sagebrush do not reestablish after disturbance for approximately 20 years (Whitson et al. 2004). Other proposed utility development within the corridor (such as the natural gas lines, Lincoln County and SPPC/NPC transmission lines) would affect only the southern portion of the CEA, which are dominated by basins and desert scrub vegetation, and therefore adverse effects would be short-term.

Development of the WPES would result in permanent disturbance of approximately 1,510 acres of vegetation on sites occupied by the generating station and towers for associated transmission lines, as well as within a new proposed rail lead connector to the NNRy.

Development of wind farms by Nevada Wind and Enexco would result in disturbance to vegetation for construction of bases for wind turbines totaling 4,470 and 4,536 acres, respectively.

Noxious and Non-native, Invasive Weeds

Indirect effects of any ground disturbing activities would likely include the spread of noxious and non-native, invasive weeds. This would be particularly true for roadway and railroad facility rehabilitation and construction as there are existing infestations along the railway.

Special Status Plants

Development within the utility corridor is the only project in the cumulative impacts scenario that would affect the Wilson Creek and Sunnyside grazing allotments where sensitive species are found within the CEA. Given the limited findings of special status plant species within the project area, it is unlikely that populations would be extensive or significantly adversely impacted by utility corridor development in the cumulative impacts scenario.

Summary

Anticipated future disturbances to vegetation within the CEA would be a measurable but relatively small proportion of the total CEA. Future disturbances are anticipated to temporarily and/or permanently reduce vegetation in the CEA. The potential for future vegetation disturbances within the CEA that result in the introduction and increased susceptibility for the establishment of noxious and non-native, invasive weeds is high. The potential for disturbances to affect special status plant species is unknown, but anticipated to be low.

5.7.5 Cumulative Disturbances

Vegetation

Vegetative cover within the CEA that would be affected by projects in the cumulative impacts scenario primarily consists of basins and desert scrub and sagebrush semi-desert. Much of the disturbance to vegetation in the CEA has been and will continue to be mitigated by reclamation activities that follow the initial disturbances.

Permanent existing disturbances within the CEA are mostly for power plants and associated developments, roadways, and transmission line towers. Additional permanent disturbances are anticipated in the future with the construction of the WPES and several new transmission lines. Disturbances to the basins and desert scrub vegetative community would result from construction activities, and would largely be short-term in duration. Long-term impacts would occur to sagebrush semi-desert communities from construction activities due to the length of time required for sagebrush to reach maturity.

Over 90 percent of the CEA is available for grazing. Grazing on allotments within the CEA has resulted in disturbance, has adversely impacted vegetation to varying degrees, and would continue in the future. Management of grazing on BLM grazing allotments under the new Ely BLM District RMP would result in monitoring of effects from grazing and modification of practices to maintain or improve vegetative communities.

The vegetation CEA totals nearly 2 million acres. Within the CEA for vegetation, known quantifiable past and present disturbances total approximately 120,382 acres. Proposed future disturbances identified above would potentially disturb another 87,331 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to vegetation within the CEA would be approximately 107,713 acres, which is approximately 11 percent of the total area of the CEA.

Noxious and Non-native, Invasive Weeds

Occurrences of noxious and non-native, invasive weeds within the CEA along the SWIP where utility development has not taken place are sporadic. However, occurrences of noxious and non-native, invasive weeds in areas of disturbance, such as near the intersection of State Highway 486 and US-93, demonstrate a dense population and wide variety of noxious and non-native, invasive weeds. The probability of invasion of noxious and non-native, invasive weeds into disturbed areas, particularly transportation routes, is high.

Special Status Plants

Cumulative effects to special status plant species are anticipated to be negligible as no plants with designated status under the ESA are identified as being found within the grazing allotments within the CEA. Only two allotments contain a total of four state sensitive species and very few sensitive species were found within the project area.

5.7.6 Cumulative Effects

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future vegetation disturbances, would result in cumulative effects to the vegetative community in the CEA being both short- and long-term and negligible to minor. Cumulative effects from noxious and non-native, invasive weeds would be long-term, minor to moderate. Cumulative effects to special status species would be negligible.

As discussed in **Section 4.7.2.1**, deposition of nitrogen and sulfur compounds from carbon fuel combustion sources can potentially lead to a reduction of available nutrients for plant growth causing stress which can lead to increases in the susceptibility of vegetation communities to effects of adverse climatic conditions; increases in pest and pathogen stress which results in reduced vegetation health; and to eventual changes in vegetation species composition. The emissions of this type from the EEC along with those of other combustion sources in the air quality CEA could pose potential cumulative effects on vegetation within this CEA. The cumulative effects of other COPCs in the emissions from both the EEC and WPES were modeled for the near field area and are discussed in the Risk Assessment narrative in **Section 5.6**.

5.8 Wildlife Resources, Including Special Status Wildlife, Migratory Birds, Fisheries, and Aquatic Species

5.8.1 CEA Boundary

Wildlife - Generally, the CEA includes suitable habitat for a given species within a 15-mile radius from the plant site, plus a 2.5-mile buffer on each side of all linear facilities. These arbitrary distances from the direct effect areas are further defined to the individual species' likely dispersal capabilities and/or more appropriately enlarged for big game (i.e. herd size and summer/winter ranges). The total area of this CEA is 2,443,792 acres.

Fisheries – The CEA boundary for fisheries is the same as for surface water, encompassing 1,992,334 acres (**Section 5.2**).

Impacts to wildlife from the air emissions within an even larger CEA are discussed in the Air Quality section of this chapter (**Section 5.6**) under the Ecological Risk Assessment discussion.

Rationale

Wildlife - Most impacts to wildlife would occur within or immediately adjacent to the project disturbance area. Impacts would mostly be limited to localized displacement at the plant site and substation sites and temporary displacement for all other components of the Project. Incidental take or permanently displacement of some individuals could occur; however, there should be no significant impacts to wildlife populations on whole. The project area does not provide unique habitats that are not already widely available adjacent to the project area, thus minimizing potential impacts related to displacement. How far individuals would displace, and the impacts of this displacement on resident populations is not known; however, given the scale of this Project, it is unlikely that any short-term or long-term, adverse impacts to wildlife species would be noticeable beyond the identified CEA.

Fisheries – Fisheries habitats are supported by surface water and near-surface ground water. The CEA incorporates natural watershed boundaries including all past, present, and reasonably foreseeable disturbances in the Duck Creek watershed downstream of the Duck Creek Impoundment.

5.8.2 Introduction

Figure 5.8-1 depicts the CEA for wildlife. Sagebrush semi-desert and basins, and desert scrub are the two dominant vegetation types within the CEA (BLM 2007i). Riparian areas and other vegetation communities also occur throughout the CEA in lesser amounts. This diversity in habitat types allows for many wildlife species to utilize the area. Types of wildlife species and their habitat found within the CEA would be very similar to those described in the affected environment for the Proposed Action, in **Section 3.8**.

In addition to BLM lands, over 68,000 acres of the 1.5-million acre Desert NWR, and nearly 1,300 acres of the 5,380-acre Pahranagat NWR fall within portions of CEA for wildlife. Both areas are managed by the USFWS, who, "...works with others to conserve, protect, and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people" (USFWS 2007c). A portion of the Desert NWR is contiguous with the Coyote Springs ACEC, and portions of the ACEC are contiguous with the Arrow Canyon, Meadow Valley Range, and Delamar Mountains Wilderness Areas. Taken together, the range and refuge along with the ACEC and wilderness areas provide a large expanse of public lands that provide wildlife habitat, in particular habitat for desert tortoise.

Past, present, and reasonably foreseeable actions in the wildlife CEA have likely resulted in both beneficial and negative impacts, at various levels, on wildlife. The foremost impact to wildlife within the area has been habitat changes associated with past and present grazing; utility transmission and distribution; and extractive industry activity. Negative impacts would include loss of habitat, displacement, and fragmentation as a result of utility distribution developments, extractive industry activity, roads, private land development, agriculture and recreation. Other impacts include noise disturbance/displacement from agriculture, extractive industry, roads, and recreational activities.

Specific to small and less mobile wildlife species (i.e., invertebrates, small mammals, amphibians, and reptiles), past impacts from direct crushing and mortality by livestock, large wild ungulates, and vehicles has likely also occurred within the CEA. In addition, grazing can contribute to impacts by increasing competition for forage, facilitating the spread of noxious and non-native, invasive weeds, changing the structure or composition of native plant communities, and degrading water quality and bank stability. Conditions in some wildlife habitat could be improved through revised grazing allotment management.

The past, present, and future disturbances with cumulative impacts to wildlife discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.8.3 Past and Present Disturbances

Within the CEA, past and present disturbances have primarily resulted from grazing and utility transmission and distribution. The majority of the CEA is enclosed within various grazing allotments. In general, wildlife are affected by livestock grazing due to competition for forage, direct mortality by trampling (i.e., amphibians and reptiles), and habitat removal/conversion.

Wildlife

Current land ownership and uses within the wildlife CEA are presented in **Table 5.1-1** and **5.1-2**, respectively.

Agriculture, Forestry, and Similar Sources of Surface Disturbance

In the previous nine years, over 4 percent of the CEA burned, and most notably, nearly 68,000 of those acres burned in 2005. In years immediately proceeding burns, barring other disturbances or significant erosion of burned areas, new vegetation growth can be prolific offering high quality forage for a wide range of wildlife species. However, loss of stands of mature vegetation reduces vegetative cover beneficial to the protection and survival of wildlife, particularly smaller species. With additional or associated disturbance (such as erosion) the spread of noxious and non-native, invasive weeds within burned areas can result, reducing the value of the area for wildlife habitat. Beneficial and adverse effects would be anticipated to be offsetting.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Extractive industry disturbance is more likely to be long-term in nature as the extractive process is lengthy, and rehabilitation of roads and other disturbance can take many years. Sand and gravel pits, including those that are active, inactive, and abandoned, occupy approximately 0.03 percent of the wildlife CEA. Development of sand and gravel pits results in long-term elimination of wildlife habitat, and reduction of the value of areas surrounding pits due to human activity. Increasing the number of roads can lead to transportation of noxious and non-native, invasive weeds into disturbed areas, further degrading wildlife habitat.

Grazing

Studies of selected allotments within the CEA have found in some cases rangeland health standards are not being met (BLM 2007b, BLM 2007c, BLM 2007d). Current grazing practices are largely not to blame for substandard range conditions, rather, historic grazing practices resulted in currently experienced substandard conditions. Substandard range health conditions adversely affect wildlife as the forage for sheep and cattle also sustain populations of antelope, deer, and elk. Substandard conditions are found on a relatively small proportion of the CEA.

Roads

Approximately 2 percent of the CEA for wildlife is disturbed by existing roads. In addition, there are numerous unmapped dirt and two-track roads accessing areas within the open BLM lands. In addition to reducing forage, increasing opportunity for erosion to degrade habitat, and the increased possibility of introduction of invasive species, roads create breaks in vegetation that make it easier for smaller species to be preyed upon, and ultimately fragment habitat. Higher speed paved roads through undeveloped areas increase risk of collisions of wildlife with vehicles, resulting in increased levels of mortality.

Industrial Development

Apex Industrial Park, a development on private land, is located just south and east of the Coyote Springs ACEC and south of the Desert NWR. Given its proximity to other high quality wildlife habitat, it is assumed that the industrial park formerly contained wildlife habitat prior to development. The current level of development of the 21,000-acre park is unknown. Given the fact that 6,000 acres within the park are advertised for sale, it is assumed that some undisturbed lands remain; however, they would be impacted by other development in close proximity within the park.

Railroad Development

The majority of the existing railroad development within the CEA consists of the unused NNRy. Because the NNRy is currently unused, the impact of the railroad grade and track on wildlife and habitat is minimal, perhaps contributing to habitat fragmentation.

Utility Production and Distribution

Approximately 5,636 acres, or 0.25 percent within the CEA for wildlife are disturbed by utility ROWs. Utility ROWs within the CEA have been developed for power transmission and the placement of water and gas pipelines and fiber optic cable. Existing power production and distribution within the CEA includes the Harry Allen complex consisting of the generating station, switchyards, and substations; and segments of numerous transmission lines. Permanent towers supporting transmission lines eliminate range resources within the tower footprints that support wildlife, they also provide perches and nest sites for raptors, which prey on smaller sensitive species such as pygmy rabbits and sage grouse. Transmission lines can cause mortality to avian wildlife through electrocution and collisions although their design is intended to mitigate this.

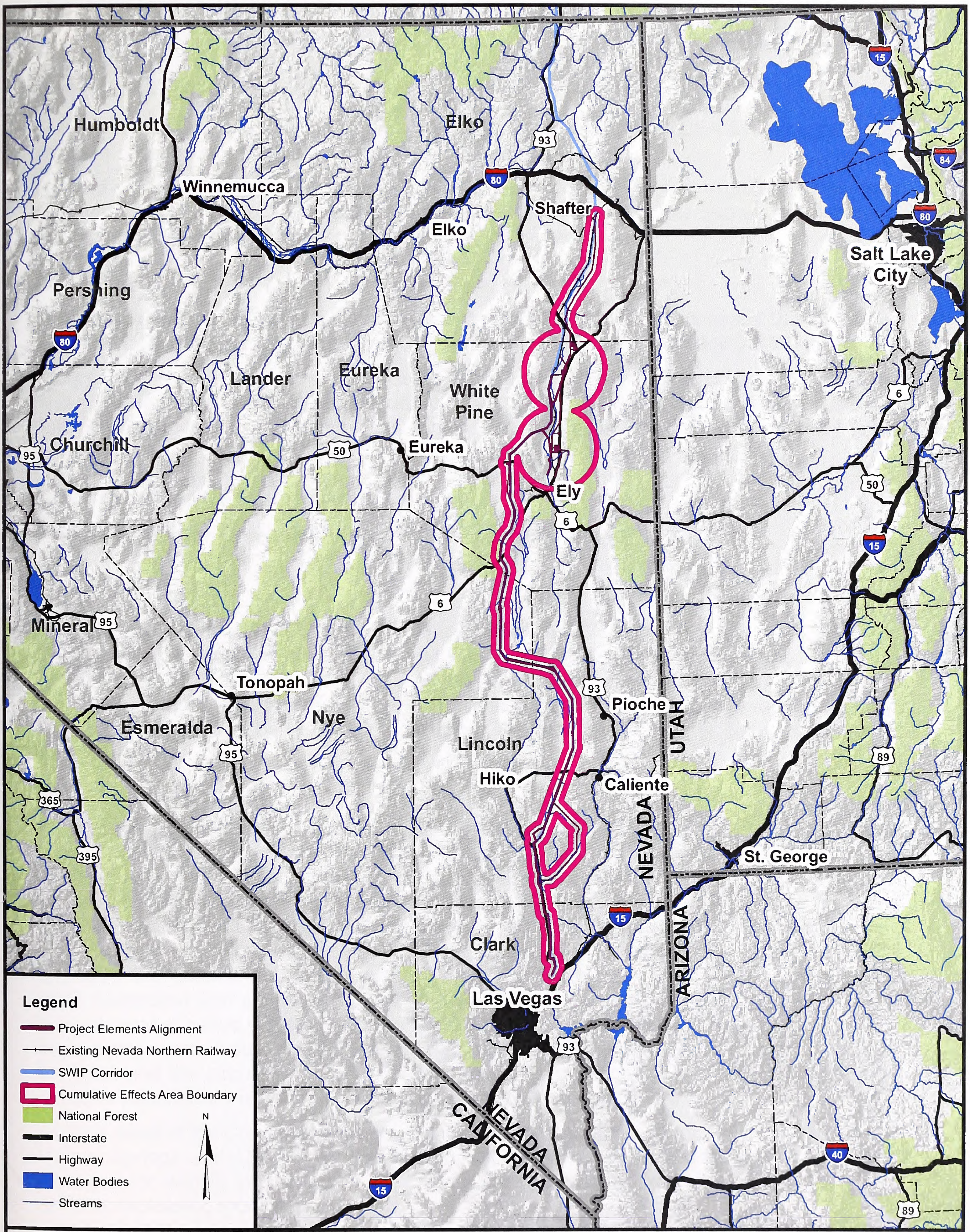
Placement of existing water supply lines and fiber optic cable within utility ROWs has disturbed vegetation. However, there are little or no surface appurtenances associated with these buried lines so the impact is short term. Removal of vegetation, that provides both forage and cover during installation of lines or cable, results in both short and long-term adverse impacts to wildlife habitat.

Installation of transmission lines, water or gas lines, fiber optic lines, or extractive industry access often require construction of roads for access. Roads may be used long-term for ongoing operations or maintenance within a mining claim or utility ROW. Road construction along with utility construction or mine operations results in direct mortality of wildlife, while long-term use and maintenance of roads can result in habitat fragmentation. Increased use of roads can lead to transportation of noxious and non-native, invasive weeds into disturbed areas, further reducing the value of habitat in the vicinity of mines and utility development.

Special Status Wildlife

The current land ownership and uses for (thus disturbances within) the special status species CEA would be the same as those described for wildlife in **Tables 5.2-1** and **5.2-2** above.

The effects described above are often amplified for special status wildlife. Sensitive species, such as pygmy rabbits, burrowing owls, and sage grouse, are adversely affected by substandard range conditions, as these species also rely on the range for food sources as well as cover. The effect of habitat fragmentation from roads described above is particularly important for smaller sensitive species, such as pygmy rabbits and sage grouse, as the "breaks" in the habitat either separate populations from each other resulting in genetic isolation, separate habitat components that are crucial at different life stages, or offer greater opportunities for predators.



Source - Base Map: ESRI and National Atlas of the United States

1:3,400,000

40 0 40 Miles

60 0 60 Kilometers

Scale is 1:3,400,000 when printed at 8.5"x11"

FIGURE 5.8-1
CUMULATIVE EFFECTS AREA
WILDLIFE, INCLUDING SPECIAL STATUS SPECIES
ELY ENERGY CENTER

Migratory Birds

The current land ownership and uses for (thus disturbances within) the CEA would be the same as those described for wildlife in **Tables 5.2-1** and **5.2-2** above.

The effects described above for general wildlife also similarly impact migratory birds. Past changes in vegetative communities and removal of native vegetation has changed or eliminated habitat used by migratory birds for cover, forage, and reproduction.

Fisheries

The current land ownership and uses for (thus disturbances within) the fisheries CEA would be the same as those described for surface water resources in **Tables 5.2-1** and **5.2-2** above.

The primary fisheries resources within the CEA are Duck Creek and Bassett Lake. Bassett Lake is used for recreational fishing. As described in Section 5.2.3 under extractive industry, the fish in these resources contain heavy metals, thus have been impacted by extractive industry in the area.

5.8.4 Foreseeable Future Disturbances

Future disturbances to wildlife are quantified in **Table 5.1-3** above.

Wildlife

<u>Agriculture, Forestry, and Similar Sources of Surface Disturbance</u>

The fire break component of the Spruce Mountain Restoration Project, anticipated to disturb approximately 16,000 acres, would have an adverse impact on wildlife from the destruction of vegetation that provides forage and cover. However, the fire break would have indirect long-term beneficial impacts by protecting vegetation, and thus wildlife habitat, from the effects of fire.

<u>Community Development</u>

The Coyote Springs community development, described in detail in **Section 5.2.4** under Community Development, could potentially have largely adverse effects on wildlife. Ultimately, approximately 31,000 acres of wildlife habitat (basins and desert scrub vegetation) would be removed for community development. Approximately 12,000 acres planned for parks, open space and multi-species habitat and a planned 17-acre lake would provide habitat and a new water source, enhancing habitability. However, overall wildlife impacts are anticipated to be long-term and adverse due to loss of habitat that was essentially contiguous with the Desert NWR (separated and somewhat fragmented by US-93) and the Coyote Springs ACEC, and from removal of native vegetation. While provision for open space and development of a man-made water source would enhance wildlife habitat, these changes would likely result in shifts in the kinds and the population levels of wildlife found as the ecosystem of the immediate area would be permanently altered and differ from the native ecosystem.

Another result of the Coyote Springs development would be increased traffic on US-93 between Coyote Springs and Las Vegas. Increased traffic in this area surrounded by public lands managed for wildlife values would likely result in increased collisions between wildlife and vehicles, increasing mortality.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities, which would involve some road construction and drilling in selected areas, would have adverse impacts on wildlife, is anticipated to be minimal at this time. However, should economic feasibility of resource development improve in the future, adverse impacts to wildlife (from direct mortality, habitat loss and fragmentation) would increase.

Grazing

Grazing would be anticipated to continue within the CEA in the foreseeable future. See **Section 5.9** for a detailed discussion of future grazing. Future range health (and therefore wildlife habitat) would be anticipated to improve with changes to the livestock grazing management systems and updated allotment management plans to meet the objectives of the allotments. Future changes to grazing management would be designed to improve range conditions, and as a result, wildlife habitat conditions would improve as well.

Industrial Development

Of the 21,000 acres within the Apex Industrial Park, 6,000 acres are currently for sale and available for future development. As stated above, it is assumed that development would result in construction of facilities that would eliminate any remaining lands from serving as wildlife habitat.

Railroad Development

Reconstruction of the existing NNRy railroad and new construction of a rail lead to the WPES plant site would take place within the CEA for wildlife. Reconstruction of the NNRy would result in disturbance of approximately 2,600 acres of wildlife habitat. Since an existing rail grade is present, direct effects of the NNRy reconstruction to wildlife habitat would result from trampling or destroying surrounding vegetation and from human activity temporarily dispersing wildlife.

Indirect effects on wildlife related to the reconstruction of the NNRy include temporary habitat disturbance within the existing ROW, primarily to greasewood and Wyoming sagebrush habitats. Worker camps, materials staging areas, borrow pits, and general grading, would potentially disturb wildlife habitat along the railway. Most of these areas would be revegetated upon completion of construction. During NNRy operations wildlife could be directly affected by noise, increased rail and vehicle traffic, and an increase in human presence along the ROW.

The proposed railroad to serve a geologic repository at Yucca Mountain would transect the project area and the wildlife CEA in north central Lincoln County. During construction, approximately 600 acres of vegetation would be disturbed, and a small portion of that area would be permanently occupied by the rail line. This area is potential range for pronghorn, elk, and bighorn sheep, and serves as winter range and a migration corridor for mule deer, therefore this development could potentially adversely impact these species.

Recreation

White Pine County and NDOW's acquisition of 6,000 acres including Bassett Lake from Kennecott Copper Company is planned to result in improvements to the lake and wetlands, which could improve riparian habitat and benefit wildlife. The improvements also include a proposed campground, picnic areas, boat launch, and restrooms, which would potentially increase human activity and deter wildlife utilization of habitat in parts of the area.

Increased human population in White Pine County would likely also increase recreational pressure on surrounding public lands. Increased human activity, hunting, and potential

increased poaching would all lead to short-term impacts to wildlife. Adverse effects to wildlife would also be experienced in the long-term with permanent increases in human population from plant operations.

Roads

While no new major highway development is currently proposed, development within the proposed utility ROWs would involve development of roads for construction as well as ongoing maintenance of infrastructure within the ROW. Additionally, increased use of public lands would lead to increased development and use of informal roads on public lands that would adversely impact wildlife through increased potential for collisions, displacement, and habitat fragmentation.

Utility Production and Distribution

The most prominent anticipated disturbance of wildlife within the CEA would be utility production and ROW development. The WPES would result in an approximate 1,902 acre disturbance which would, in part, be mitigated by a permanent development of existing wildlife habitat in White Pine County, and would contribute to further development of utility ROWs through the installation of transmission lines. Development of the WPES would result in permanent disturbance of approximately 1,510 acres of wildlife habitat on sites occupied by the generating station and towers for associated transmission lines, as well as within a new proposed rail lead connector to the NNRy.

Three major planning efforts address the development of multiple-use utility corridors: the WWEC Programmatic EIS (PEIS); the designated BLM Utility Corridor; and the SWIP Corridor. All three planning projects address the utility corridor within the CEA. The possible development scenarios for this corridor are discussed in greater detail in **Section 5.2**.

Maximizing the corridor with overhead transmission lines would result in the greatest permanent long-term impact to wildlife through placement of structures for transmission lines, creating perches as well as hazards for birds of prey, and construction of maintenance roads that fragment habitat. As described above, the corridor would be able to accommodate up to six transmission lines in a 2,640-foot wide corridor.

Several proposed projects within the CEA would develop water resources and transport the water through pipelines to be located within portions of the utilities corridor. Should the entire corridor be maximized with underground water, petroleum, or natural gas pipelines, wildlife habitat would be disturbed in the short term due to construction; however, assuming effective reclamation, there would be little permanent disturbance of habitat.

Utilization of the corridor for a combination of transmission lines and underground pipelines would be most likely, resulting in a combination of short-term and long-term disturbance. It is possible that the entirety of the corridor would not be developed. Construction corridors can be revegetated; however, disturbance has high potential to lead to the incursion of noxious and non-native, invasive weeds that reduce the quality of wildlife habitat.

Special Status Wildlife

Future effects to special status wildlife would be similar to those described under past and present disturbances above.

Migratory Birds

Future effects to migratory birds would be similar to those described under past and present disturbances above.

Fisheries

Fisheries resources would continue to be impacted by metals contamination resulting from the extractive industry downstream of the KCC tailings area. They would also be impacted by land disturbing activities that would result in increased sedimentation and degraded water quality, as described in **Section 5.2**.

5.8.5 Cumulative Disturbances

The wildlife CEA totals over 2.2 million acres. Within the CEA for wildlife, known quantifiable past and present disturbances total approximately 132,343 acres. Proposed future disturbances would potentially disturb another approximately 87,331 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to vegetation within the CEA would be approximately 325,674 acres, which is nearly 13 percent of the total area of the CEA.

Over 90 percent of the CEA is available for grazing. Grazing on allotments within the CEA has resulted in disturbance, has adversely impacted vegetation to varying degrees, and would continue in the future. Management of grazing on BLM grazing allotments under the new Ely BLM District RMP would result in monitoring of effects from grazing and modification of practices to maintain or improve vegetative communities, which would result in improved wildlife habitat.

5.8.6 Cumulative Effects

TEPC Species

Desert Tortoise

Approximately 138,000 acres of the CEA for wildlife are desert tortoise habitat, located in an area approximately 40 miles either side of the Cark/Lincoln County line. Both above and below ground development within the utility corridor in this area would adversely impact desert tortoises. Temporary adverse impacts to desert tortoise would result from noise and human activity associated with construction activities within the corridor. Short-term impacts could result from direct mortality of individuals reducing population levels and potential destruction of burrows, although these impacts would be reduced and possibly eliminated through implementation of mitigation measures. Short- to long-term impacts to desert tortoise would result from clearing of vegetation that provides forage and cover.

Long-term impacts would result from the permanent loss of habitat as new transmission line towers would occupy land; from transmission line towers creating perches for birds of prey (particularly ravens); increasing predation in the vicinity of the transmission lines; from maintained access roads creating permanent breaks in vegetation and potentially fragmenting

habitat. Fragmentation is a major contributor to population declines in desert tortoises because tortoises have large home ranges (over 1.5 square miles of habitat per tortoise, USFWS 1994). When home ranges are fragmented, tortoise movements are restricted and tortoises are less able to self regulate population densities and find mates outside an isolated pool. This creates relatively small populations that are more susceptible to extinction.

The Coyote Springs development, located within the wildlife CEA, is essentially surrounded on the north, east, and south sides by the Coyote Springs ACEC protecting critical desert tortoise habitat. As the development is surrounded by desert tortoise habitat, the development would result in a loss of up to 31,000 acres of desert tortoise habitat, reducing available habitat and further fragmentation of remaining habitat.

Implementation of mitigation measures as those described in **Section 4.8.2.5** would help to reduce potential impacts to desert tortoise. Overall cumulative effects to desert tortoise would be short- and long-term and moderate.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse

Most of the area within a 50-mile radius of the proposed plant sites, and the CEA along the proposed transmission line ROW south from the plant sites to just inside the Lincoln County border is yearlong sage grouse range, totaling nearly 700,000 acres. In this area, the projects that could result in cumulative effects to sage grouse would include the White Pine Energy Station, utility corridor development, development and use of roads, and increased recreational activity.

Temporary effects to sage grouse due to human activity during construction would extend to acreage beyond the actual development due to the fact that human disturbance associated with construction activities would discourage habitation of the area. Vegetation trampling and clearing required for transmission facility distribution would reduce or eliminate vegetation for foraging and cover in the short term. Because some species of sagebrush require 20 or more years to mature, some adverse wildlife effects from vegetation removal may be long-term as well.

Construction of the WPES facility would permanently reduce yearlong sage grouse range, resulting in a long-term adverse impact to sage grouse. However, this would represent less than a 0.5 percent reduction in sage grouse range within the CEA for wildlife. Development of the WWEC/SWIP Corridor for infrastructure related to the WPES, as well as other transmission facilities, would adversely impact sage grouse. Construction of transmission line towers would permanently remove lands from sage grouse habitat. In the long term, despite installation of perch prevention devices, transmission towers would likely serve as perches for birds of prey, enhancing predation of sage grouse along the corridor.

Roads developed for construction or ongoing maintenance would break the vegetative cover and depending on the level of use could further fragment habitat. Increased recreational use on public lands could result in increased habitat fragmentation and unintentional disturbing of leks and mating strategies that could lead to further population declines. However, the amount of public lands available for recreation and the extent of potential sage grouse habitat available moderates these effects.

Implementation of mitigation measures such as those described in **Section 4.8.2.5** during work within the utility corridors on public lands would help to reduce potential impacts to sage grouse.

Overall cumulative effects to sage grouse would be short- and long-term, minor to moderate.

Pygmy Rabbits

Because pygmy rabbits are typically found in areas of tall, dense Wyoming sagebrush, and were observed in the northern portions of the project area, they would most likely be found in the northern portions of the CEA in areas of Wyoming sagebrush semi-desert vegetation. Because of the pygmy rabbits' dependence upon sagebrush habitat and susceptibility to predation, cumulative impacts to pygmy rabbits would be very similar to those described above for sage grouse. Overall cumulative effects to pygmy rabbits would be short- and long-term, minor to moderate.

Raptors

Known locations for various species of raptors are found within the CEA in the northern portions of the CEA within the radii of the proposed plant sites. In addition, many species of raptors utilize the diversity of habitats that exist throughout all of the proposed electric transmission line segments, and thus would utilize these areas. Noise and increased human activity associated with the construction of the transmission lines and power production facilities would have a temporary impact on nesting and foraging activities. Mitigation measures similar to those discussed in **Section 4.8.2.5** could be employed prior to and during construction activities that would greatly reduce the likelihood of raptor nesting behavior being disrupted or nests being destroyed. Transmission lines result in adverse effects to raptors due to collisions between birds and lines. Beneficial effects to raptors from transmission lines result from improved hunting opportunities from the towers. The intensity of these impacts would vary according to species, but impacts that are a direct result of construction activities and presence of towers and lines are not expected to exceed a negligible level.

Increased usage of US-93 and human presence on public lands may result in increased mortality and affect habitat usage patterns; however, these long-term adverse effects to raptors would be anticipated to be negligible.

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future disturbances, would result in expected cumulative effects to wildlife being short- and long-term, minor and adverse.

Burrowing Owls

Suitable habitat for burrowing owls occurs throughout various portions of the project area, and thus throughout the CEA. The introduction of new transmission lines in utility corridors within the CEA for wildlife increases the likelihood of burrowing owls experiencing in-flight collisions with towers and lines. The presence of transmission lines may also deter burrowing owls from nesting in previously occupied habitat. The operations, maintenance, and abandonment of electric transmission lines would have both short-term and long-term impacts on burrowing owls. The magnitude of these cumulative impacts could range from minor to moderate.

Burrowing owls may habituate themselves to humans as well as anthropogenic structures and machinery. As a result, burrowing owls would likely avoid nesting in these areas, but over time may resume foraging in these areas. Overall cumulative effects to burrowing owls would be short- and long-term, negligible to minor.

Bats

Bat roosting areas could be present within the CEA. Construction activities could disturb bats in the short term, while increased population and industrialization could have a longer term adverse impact. Bats likely use most of the CEA for foraging opportunities. Construction activities could cause bats to temporarily abandon foraging within active work zones. Changes to or removal of vegetative cover could reduce the quality of insect life available to sustain bat populations. However, short- and long-term cumulative effects to bats would only be anticipated to be negligible.

General Wildlife

Pronghorn Antelope

Most of the CEA for wildlife is habitat for pronghorn antelope, except for the higher elevations. Development within the SWIP Corridor throughout the CEA north of Segment 9B would disturb pronghorn antelope in the short term due to human activity. Cumulative adverse impacts to pronghorn would be short-term and negligible to minor, depending on the magnitude of concurrent development within the SWIP Corridor.

Potential concurrent construction of the WPES and EEC in the northern portion of the CEA for wildlife would result in increased traffic on US-93. Increased traffic on US-93 would be expected to result in an increase in collisions between individuals and vehicles. Mortality from vehicle collisions resulting from increased traffic on US-93 would be expected to have negligible to minor short-term adverse impacts on pronghorn populations.

Adverse effects to pronghorn antelope from construction of the proposed WPES would be similar to those of the EEC, resulting in permanent loss of habitat. However, due to the extent of pronghorn habitat within the CEA, permanent losses of habitat should result in negligible long-term effects. An increase in the human population within White Pine County would result in increased human activity within pronghorn habitat, potentially concentrating pronghorn populations in lesser used areas. Long-term loss of habitat from permanent transmission towers located within the SWIP Corridor and from increased human activity within pronghorn habitat would be anticipated to have negligible adverse impacts on pronghorn antelope due to the large extent of suitable habitat within the CEA.

Overall cumulative effects to pronghorn antelope would be short- and long-term, and negligible to minor.

Mule Deer

Mule deer year-round range is found within the CEA for wildlife in the northern portions of the CEA at higher elevations within the radii of the proposed plant sites. The majority of development contained within the cumulative effects scenario would not be within the mule deer year-round range. The SWIP Corridor does cross through summer and winter range, crucial winter range and migration corridors in several locations. Effects to mule deer from power plant construction, increased traffic on US-93, development of the SWIP Corridor, and increased recreational use of public lands would be similar to those described above for pronghorn antelope.

Overall cumulative effects to mule deer would be short- and long-term, and negligible to minor.

Elk

The majority of the area of the CEA for wildlife is potential elk habitat, with exception of the WWEC/SWIP utility corridor south of and along US-93 in Lincoln County. The construction of the Robinson Summit Substation in conjunction with development within the utility corridor may disturb elk and alter their movement patterns. Because those developments are in the immediate vicinity of US-50, the disturbance could result in increased elk presence along the highway, and increased incidence of collisions with vehicles. All other effects to elk from power plant construction, increased traffic on US-93, development of the SWIP Corridor, and increased recreational use of public lands would be similar to those described above for pronghorn antelope.

Overall cumulative effects to elk would be short- and long-term, and negligible to minor.

Bighorn Sheep

A large area of potential bighorn sheep habitat is found within the CEA for wildlife in the northern portions of the CEA at higher elevations within the radii of the proposed plant sites. However, no projects within the cumulative effects scenario are anticipated to impact these areas.

The SWIP Corridor within the CEA for wildlife crosses both potential and occupied desert bighorn habitat from the vicinity of the proposed plant sites to the southern terminus of the CEA. Increased traffic on US-93 between Las Vegas and the new Coyote Springs development could result in increased collisions between vehicles and individuals, increasing mortality. Effects to bighorn sheep from development of the SWIP Corridor and increased recreational use of public lands would be similar to those described above for pronghorn antelope.

Overall cumulative effects to bighorn sheep would be short- and long-term, and negligible to minor.

Migratory Birds

The introduction of new transmission lines increases the likelihood of avian wildlife and waterfowl experiencing in-flight collisions with towers and lines. Development of the EEC and WPES and the utility ROWs would increase the number of transmission lines and towers, increasing the potential incidence of collision. In areas where high-density migration takes place within the utility ROWs, including design features intended to reduce collisions by making transmission lines more visible to avian wildlife and waterfowl would likely take place. Transmission towers would be designed to reduce electrocutions, roosting, perching, and nesting. These measures would mitigate most adverse effects.

Overall cumulative effects to migratory birds would be short- and long-term, and negligible to minor.

Fisheries

Fisheries resources have metals contamination resulting from the extractive industry downstream of the KCC tailings area, and are stressed by sedimentation resulting from ground disturbance. Such contamination and ecological stress would be anticipated to continue in conjunction with existing disturbances and future development, particularly extractive industry activity. However, the Proposed Action would only make a negligible contribution, at most, to cumulative adverse effects to fisheries resources species.

5.9 Range Resources

5.9.1 CEA Boundary

The CEA boundary for range resources includes the full extent of the allotments and the permittees of those allotments that occur within the boundaries of the power plant sites, NNRy/rail leads, the Alternative Rail Line, and the SWIP Corridor, including the transmission line alignment alternatives. The total area of this CEA is 5,592,916 acres.

Rationale

Portions of each of these allotments occur within the direct effects area and could be impacted by the Project. Livestock displaced from the direct effects area by the project would likely be moved to other portions of the allotments outside of the direct effects area.

5.9.2 Introduction

Figure 5.9-1 depicts the CEA for range resources. The entire CEA for range resources is enclosed within various grazing allotments. Range resources within the CEA would be similar to those described for the project area in **Section 3.9**.

Cumulative effects to range resources in the CEA primarily occur from historic fire suppression and grazing activities; ongoing grazing; utility production and distribution; recreation; and extractive industry activities. These activities reduce public lands available as range resources, or result in adverse effects to the resource such as spread of noxious and non-native, invasive weeds, or loss of vegetative cover.

5.9.3 Past and Present Disturbances

Current land ownership and uses within the range resources CEA are presented in **Tables 5.1-1** and **5.1-2,** respectively.

Development of the West changed range conditions through historic grazing practices; activities that altered natural hydrology; irresponsible use of fire; introduction and transportation of invasive and exotic species; and fire suppression. The combination of these led to establishment and prolific expansion of invasive and exotic species, such as cheatgrass. Changes in vegetative cover in conjunction with fire suppression led to further changes in range conditions that favored invasive and exotic species over native vegetative cover. Widespread changes in vegetative cover changed the fire regime and enhanced the effects of uncontrolled fire (Young and Blank 1995). Together these effects have altered ecosystems processes, vegetative cover, and range resources found within the CEA.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Thirty existing mining claims or districts are located within the CEA. Approximately 581 acres, or 0.01 percent, of the CEA is disturbed by gravel pits. The area disturbed by the extractive industry (mining, gas/oil exploration and development) reduces acreage available for grazing within the CEA, resulting in long-term impacts to range resources. Currently, extractive activities within the CEA for range resources are minimal; therefore adverse impacts would be negligible.

The McGill Tailings Reclamation Area is private land that has been revegetated with native grass species, and provides lands for grazing that would otherwise have been displaced by tailings storage.

Grazing

The foremost past and present impacts to range resources within the area have been recent past grazing practices; utility production and transmission/distribution; and extractive industries activity. Over five million acres, nearly 94 percent of the CEA is available for grazing.

Past and present disturbances to range resources from grazing would be the same as conditions described for range resources in the affected environment, **Section 3.9**.

Roads

The CEA for range resources contains over 51,000 acres of disturbance from roads. Existing roads impact livestock by reducing acreage available for grazing, separation of grazing allotments, and through collisions between livestock and vehicles. Given that roads only occupy 0.92 percent of the CEA, the impacts on range resources from roads are minimal.

Railroad Development

Existing railroad developments within the CEA include the NNRy and UPRR. The currently unused NNRy has little effect on range resources as it is not currently operational. As the grade and track occupy land, there is a small reduction in grazing land; however, this would have no appreciable effect on grazing.

Utility Production and Distribution

Existing utility production and distribution facilities reduce available acreage in grazing allotments in the long term as structures (power plants, substations, transmission line towers) permanently remove vegetation and occupy the land. Existing roads and railroads transect grazing allotments, removing vegetative cover. In areas where the roadways are fenced, this creates a separation in the allotment. Unfenced areas create the potential for collision of automobiles and trains with livestock.

5.9.4 Foreseeable Future Disturbances

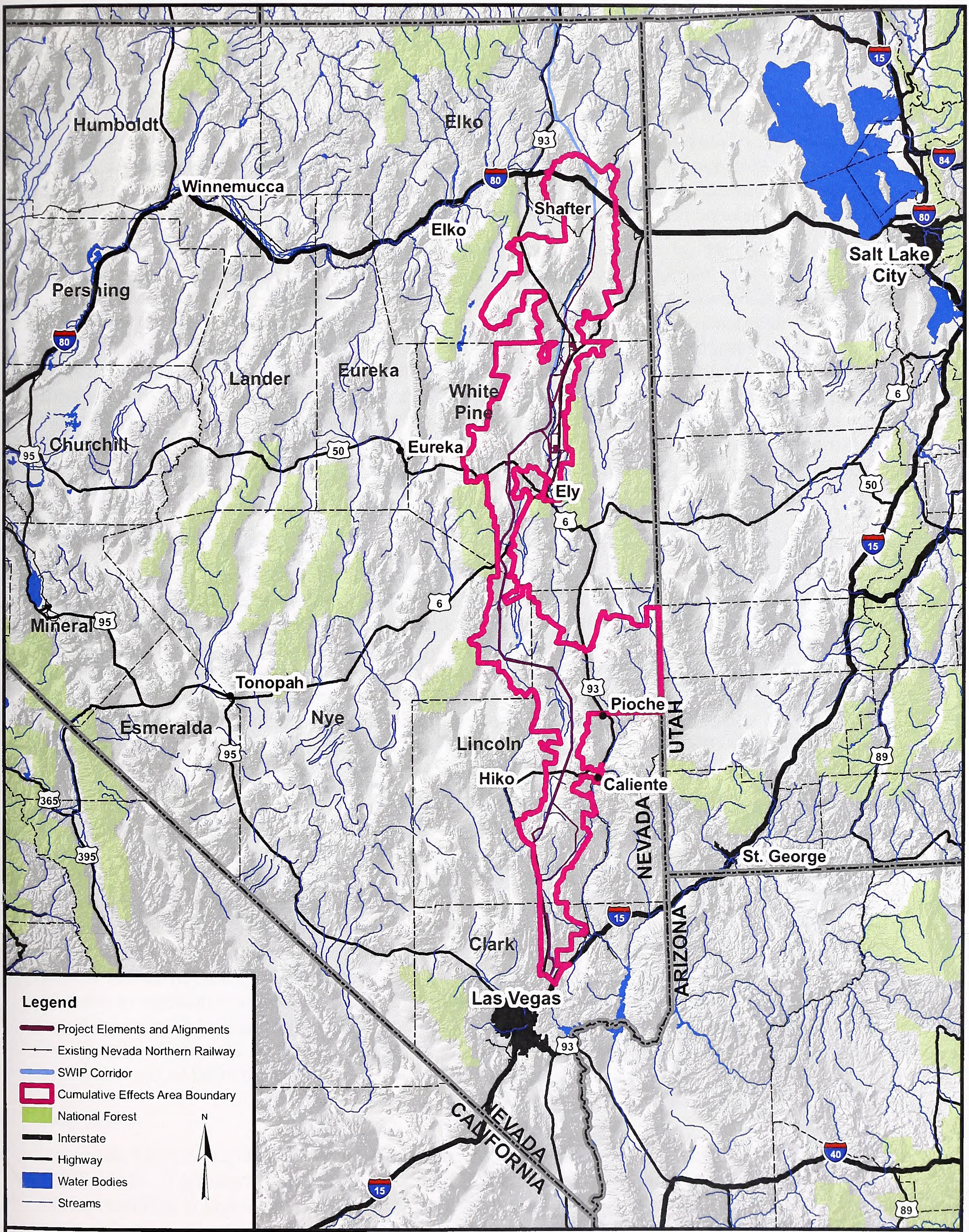
Future disturbances to range resources are quantified in **Table 5.1-3** above.

Agriculture, Forestry and Similar Sources of Surface Disturbance

The planned Spruce Mountain Restoration Project fire break, an approximate disturbance of 16,000 acres, would have direct adverse effects by reducing forage, and indirect long-term beneficial impacts by protecting range resources from the effects of uncontrolled wildfire, and continued deterioration of range resources.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities (mining or oil and gas development) and related impacts on range resources would be anticipated to be minimal. However, should economic feasibility of resource development improve in the future, adverse impacts to range resources would increase in acreage as well as intensity.



Source - Base Map: ESRI and National Atlas of the United States

1:3,400,000

40 0 40 Miles

60 0 60 Kilometers

Scale is 1:3,400,000 when printed at 8.5"x11"

FIGURE 5.9-1
CUMULATIVE EFFECTS AREA
RANGE RESOURCES
ELY ENERGY CENTER

Grazing

Grazing on public lands would continue within the CEA in the foreseeable future. Management of grazing under the Ely BLM District RMP (2007a) is discussed in detail in **Section 5.2.4** above. Under the Ely RMP, the BLM will continue to monitor and evaluate allotments to determine if they are continuing to meet or are making significant progress to meeting the standards for rangeland health, and management prescriptions would be adjusted accordingly.

Future range health would be anticipated to improve. Changes to the livestock grazing management systems are proposed to improve the overall management of livestock on the affected allotments, and updates to the allotment management plans would help to meet the objectives of the allotments. Through the permitting process some allotments have been identified where standards have not been met, however, significant progress is being made toward meeting standards. Future changes to grazing management on any identified substandard allotments would be designed to improve range conditions, resulting in a long-term negligible to minor beneficial impact to range resources. However, without active improvements to grazing management, the substandard conditions could contribute to the expansion of invasive and exotic species and ecological change that result in long-term adverse effects to range resources.

Railroad Development

Reconstruction of the existing NNRy railroad, anticipated to disturb approximately 2,600 acres, and new construction of a rail lead to the WPES plant site would take place within the CEA. An existing rail grade is present and direct effects of the NNRy reconstruction and associated access roads, laydown areas, and borrow pits would result from trampling or destroying surrounding vegetation and from human activity temporarily dispersing livestock grazing. The reconstructed railroad would cross 15 allotments and may separate livestock from water sources. The rail line would not be fenced, therefore some hazard of collisions between trains and livestock would be anticipated as a minimum 21 train trips per week (9 for EEC and 12 for WPES) would be anticipated with operation of the NNRy.

The proposed railroad to serve a geologic repository for disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain would transect the project area and the CEA for range resources, cutting across the Wilson Creek and Ely Spring (cattle) grazing allotments. Construction of the proposed rail line across the CEA for range resources would result in disturbance of a total of 3,252 acres (USDOE 2007a). Upon completion of construction, the rail line would permanently occupy lands currently used for grazing, potentially displacing up to 194 AUMs from these two allotments. These two allotments are currently permitted to graze over 50,000 AUMs (USDOE 2007b); therefore the adverse impact of reduction in AUMs would be minimal. In addition to reducing AUMs, the rail line would create separation within the allotments requiring animals to learn new routes and could potentially lead to collision with trains. Because the density of animals on these allotments is low, the potential adverse effects from collision with trains would be minimal.

Recreation

Increased human population would likely also increase recreational pressure on surrounding public lands. Increased human activity would likely involve increased vehicular use on public lands, resulting in increased soil disturbance that would lead to increased infestation of noxious and non-native, invasive weeds. These effects could result in long-term degradation of range resource quality.

Roads

Under the new Ely BLM District RMP, OHV use will be largely limited to existing roads and trails within the majority of the CEA. Enforcement of this management policy would result in maintaining the number and extent of existing roads and trails, and prevention of establishment of new road disturbance within grazing allotments, avoiding future degradation of range resources.

Utility Production and Distribution

Future WPES production and distribution facilities and fixtures would adversely impact grazing allotments in both the short and long term. Approximately 1,900 acres would be disturbed through construction. Approximately 1,500 acres permanently occupied by facilities and transmission towers would no longer be available for grazing, potentially reducing the AUM capacity of the allotments. Impacts to range resources from future utility production and distribution facility development would be similar to those discussed above in **Section 5.7**, Vegetation.

5.9.5 Cumulative Disturbances

The CEA for range resources totals nearly 5.6 million acres. Within the CEA for range resources, known quantifiable past and present disturbances total approximately 329,731 acres. Proposed future disturbances identified above would potentially disturb another approximately 30,432 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to vegetation within the CEA would be approximately 466,163 acres, which is approximately 8 percent of the total area of the CEA.

Nearly 94 percent of the CEA is available for grazing. Grazing on allotments within the CEA has resulted in disturbance, has adversely impacted vegetation to varying degrees, and would continue in the future. Management of grazing on BLM grazing allotments under the new Ely BLM District RMP would result in monitoring of effects from grazing and modification of practices to maintain or improve vegetative communities, which would result in improved range resources.

5.9.6 Cumulative Effects

Adverse effects have occurred to range resources from historic practices, but the affected acreage is relatively small. Future short- and long-term adverse cumulative impacts to, and permanent loss of range resources would result from construction associated with additional development of utility production and transmission facilities, and railroads within the CEA. Long-term beneficial impacts to range resources may be realized through modified grazing management practices on allotments with substandard conditions.

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future range resources disturbances, would result in cumulative effects to range resources, expected to be short- and long-term, minor and adverse.

5.10 Cultural Resources

5.10.1 CEA Boundary

The CEA boundary for cultural resources is the same as that for surface water (**Figure 5.2-1**).

Rationale

The entire Steptoe Valley needs to be considered due to the project's visibility from historic properties (i.e., NRHP-eligible cultural resources) in the valley. Beyond Steptoe Valley, the project should not affect cultural resources outside of the direct effects area. Activities attached to the Proposed Action and Action Alternatives that might affect cultural resources could occur outside of the actual disturbance area, but not likely outside of this proposed CEA.

5.10.2 Introduction

Cultural resources potentially vulnerable to the cumulative effects of the EEC include prehistoric sites, prehistoric landscapes, historic sites, historic structures, traditional cultural properties, and historic landscapes. The incremental degradation of the resources reduces the information and interpretive potential of historic properties. Data recovery in the form of excavation or artifact collection is considered an adverse effect. Further, large projects tend not to mitigate every site to be impacted but rather a representative sample of sites. Therefore there is the loss of information from those sites not mitigated. Although this approach may not have a large impact on cultural resources as a result of a single project, the cumulative effect of many large projects in a region can amount to a major loss of scientific and historic information about the local and regional past.

A records search of all lands within a one-mile radius of the EEC project components was conducted. The search revealed that 308 previous cultural resource studies have been conducted resulting in the documentation of 1,006 sites. The previous inventory information for the CEA was compiled from data collected for the project-specific cultural resource inventories associated with the EEC and does not include the entire CEA area.

5.10.3 Past and Present Disturbances

Land ownership and use as it relates to cultural resources is detailed in **Tables 5.1-1** and **5.1-2** above.

Past and present disturbances in the CEA that have potentially affected cultural resources include fire, road construction and maintenance, utilities, mining, mineral material activities (quarry/gravel pit), ranching/agriculture, and other developments (see **Section 5.2.3** and also **Appendix 5A**). Known sites that have been determined ineligible for the NRHP do not require avoidance; have been discharged from management (BLM 2008a); and therefore have likely been impacted by activities requiring the inventory (i.e. utility installation, fence projects, energy exploration). As directed by Section 106 of the NHPA, eligible sites are generally avoided or mitigated if avoidance is not possible for projects with a federal or state nexus. Projects/development disturbances conducted prior to 1966 (i.e., prior to NHPA) and/or those without a federal or state nexus generally did not identify/quantify cultural resource sites or impacts to them.

5.10.4 Foreseeable Future Disturbances

The reasonably foreseeable disturbances in the CEA are described in **Section 5.2.4** and quantified for the cultural resources CEA in **Table 5.1-3** above.

Railroad Development

Reconstruction of the NNRy has been proposed by the City of Ely and is currently being evaluated by the Army Corps of Engineers (Corps 2008); however the BLM has assumed responsibility for completing the Section 106 compliance for the railroad reconstruction in accordance with the EEC Programmatic Agreement. This project could impact numerous NRHP-eligible sites located along the rail line (Southworth 2008). Further, the NNRy is itself an eligible historic property. The NRHP-eligible sites within the NNRy right-of-way would be avoided by design or mitigated (Corps 2008). Rehabilitation of the railway could adversely affect aspects of its integrity including design, materials, and workmanship; this would be an adverse impact and would be mitigated.

Utility Production and Distribution

As disclosed in the WPES EIS (BLM 2007e), construction of the WPES would impact six or seven NRHP eligible sites, depending on the plant location. Data recovery efforts would minimize these impacts. Construction of proposed utilities within the SWIP Corridor (**Appendix 5A**) could also potentially impact eligible sites.

Community Development, Recreation, and Land Use

Changes to private agricultural lands within the CEA are likely as some of these lands are converted in the future from traditional agricultural utilization (farming and ranching) to more residential and recreational utilization. However, specific plans are not known and cannot be evaluated for this analysis. Other lands, private and public, have been proposed for community development (e.g. Coyote Springs Development, Hidden Valley Community Project).

Impacts to cultural resources would depend on the exact project location and extent of ground disturbance. As much of the CEA is on federal land (87.4 percent), future disturbances would be subject to NEPA, Section 106 of the NHPA, and state and federal regulations providing protection and management of cultural resources.

5.10.5 Cumulative Disturbances

Past and present disturbance to cultural resources in the CEA have been the result of utility installation, road development, ranching/agriculture, private development, archaeological excavation, recreational activities, and likely vandalism and unauthorized artifact collection (**Appendix 5A**). Since the majority of the CEA is under federal jurisdiction, impacts to eligible cultural resources have generally been avoided or mitigated through Section 106 oversight. Cumulative impacts to cultural resources from reasonably foreseeable projects would mostly result from ground disturbance related to new commercial or industrial developments.

Past and present disturbance has impacted cultural resources (**Section 5.2.3**). NRHP-eligible sites within permitted disturbance areas were subject to oversight of Section 106 of NHPA; therefore impacts or the loss of the resource was mitigated.

Increased disturbance from multiple actions could result in cumulative adverse impacts to currently unknown cultural resource sites. Increased accessibility created by new roads built in

association with projects can cause cumulative impacts related to increased public visitation, recreational impacts, unauthorized artifact collection, and vandalism.

The cultural resources CEA totals nearly 2 million acres. Within the CEA for cultural resources, known quantifiable past and present disturbances total approximately 120,382 acres. Proposed future disturbances identified above would potentially disturb another 87,331 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to cultural resources within the CEA would be approximately 313,713 acres, which is approximately 16 percent of the total area of the CEA.

5.10.6 Cumulative Effects

Current and future development will contribute to the cumulative effects, both direct and indirect, on prehistoric and historic cultural resources in the region. All proposed, reasonably foreseeable developments would be completed under the oversight of Section 106 of NHPA if there were a federal nexus and project impacts would therefore be individually addressed. The effects of adding the EEC impacts to existing cultural resource disturbances would be minimal. Section 106 of the NHPA requires avoidance and/or mitigation of impacts to NRHP-eligible cultural resources by federal undertakings; therefore, cumulative impacts from the EEC and reasonably foreseeable future activities should be minimal. Data recovery of NRHP-eligible sites would expand the regional database and knowledge of prehistoric and historic contexts. The mitigation measures developed to avoid direct impacts to cultural resource would also minimize contributions to cumulative effects.

In regard to the Steptoe Valley Historic Landscape, the addition of two coal-fired power plants (the EEC and WPES) within Steptoe Valley would constitute an adverse cumulative impact. The power plants would be visible to varying degrees over a large portion of Steptoe Valley. These modern industrial complexes would alter the rural feeling and setting of the Steptoe Valley Historic Landscape, affecting its integrity (i.e. the characteristics which make it eligible for the NRHP). The cumulative impact on the area landscape from multiple projects would be greater than from the EEC project alone.

Use of the NNRy for projects such as the WPES and the EEC would be consistent with its original intent and purpose: to support industrial development. An operating railroad can be expected to have had its rails and ties replaced periodically; however, one of the unique features of the NNRy is that there was no wholesale replacement of rails and most are original dating to around 1905 (Murphy 2008). Working historic transportation facilities can retain integrity if physical features essential to the property remain (such as route, roadbed, associated features, alignment, and setting). Reconstruction of the track would at a minimum require replacement of culverts, bridges and other supporting features, which would adversely impact its integrity under Criterion C and limit its future physical research potential under Criterion D. Reconstruction to modern railroad standards (**Section 2.2.4.3** and **Figure 2.2-8**) with a 30 foot wide roadbed as well as borrow ditches, borrow areas, and slope cuts would likely obliterate the entire historic grade and associated features, as well as many of the other cultural resources within the corridor. The NNRy is currently eligible for the NRHP under criteria A (association with broad patterns of history), C (technology), and D (future data potential). It would remain

eligible under criterion A for its association with significant events in local and regional history, specifically development of mining, transportation, commerce, and settlement of the Ely area and the western United States. The cumulative effect of the NNRy reconstruction project on the historic railway and use of the railroad by the EEC and WPES would constitute an adverse impact to the site's integrity; mitigation measures would minimize the cumulative impact to the extent possible.

5.11 Native American Concerns

5.11.1 CEA Boundary

The CEA boundary for Native American concerns is the same as that for surface water (**Figure 5.2-1**).

Rationale

This boundary was chosen because it encompasses the area where there could be indirect effects to known culturally significant places and direct affects to cultural resource sites.

5.11.2 Introduction

The BLM initiated Native American consultation with regard to the EEC project with the Section 106 consultation letter sent out in July 2007, and since then consultation has been ongoing. The Tribes consulted are listed in **Table 3.11-1**. Consultation included letters, phone calls, and meetings. Through this process, the BLM requested information from the Tribes about geographically important places, traditional cultural places (TCPs), and sacred sites that may be impacted by the EEC Project. Further, previous ethnographic studies have identified places of geographic interest to the Tribes within the CEA.

Native American tribes are generally concerned with public distribution of information regarding the nature or location of TCPs, sacred sites, or geographically important places; therefore any specific information provided to the BLM has been held as confidential.

The ability of Native Americans to practice their traditional culture may be reduced through modification of the landscape; loss of available or open land due to developments and private ownership; and degradation of resources over time. Resources such as water, plants, and wildlife not only provide subsistence, but play an important role in Native American culture and lifeways. In addition, archaeological sites and artifacts retain power and life-force; alteration of these places or removal of objects can disturb traces of the past and existing power relationships.

5.11.3 Past and Present Disturbances

Land ownership and uses for (thus disturbances within) the Native American concerns CEA is detailed in **Tables 5.1-1** and **5.1-2** above.

Past and present impacts to resources utilized by Native Americans, such as water, vegetation, and wildlife, are described in **Sections 5.2**, **5.7**, and **5.8,** respectively. Projects/ developments/disturbances that occurred prior to implementation of the NHPA of 1966 or without a federal or state nexus may have impacted archaeological sites and objects of importance to the Tribes. A record search indicates that 308 previous cultural resource studies have been conducted within one-mile of the EEC project components and over 1,000 cultural resource sites were recorded. While not all cultural resource sites identified by these studies

have been impacted by the projects for which they were conducted, other cultural resource sites have been impacted by projects and other land use activities for which cultural resource studies were not conducted. In general, artifact collection associated with archaeological surveys and archaeological excavations as mitigation are considered impacts to the Tribes and contribute to cumulative impacts. No previous disturbances to TCPs, sacred sites, or geographically important places were indicated by the Tribes during consultation at this time.

Three places of cultural and/or geographic interest are located within close proximity along the NNRy in Steptoe Valley. It is unknown whether these have been disturbed by activities associated with the NNRy, ranching, or other activities.

As noted in **Table 5.1-2**, a minimal amount of the CEA has been disturbed. Approximately five percent of the CEA has been impacted by disturbances including mine tailings, gravel pits, roads, agriculture, utility ROWs, and urban development. Additional unquantified disturbances such as mining and rural development have also disturbed area within the CEA. Further, grazing has taken place on 90 percent of land within the CEA. Cumulative disturbances to resources utilized by the Tribes are presented in the associated sections (**Section 5.2** - Water, **Section 5.7** - Vegetation, **Section 5.8** - Wildlife).

5.11.4 Foreseeable Future Disturbances

Reasonably foreseeable future impacts to resources utilized by the Tribes within the CEA are described in **Section 5.2.4** and would likely include continuation of grazing, recreation, development of private lands, energy development, utility line development, fire management, and mining (see **Appendix 5A**). Disturbances to Native American concerns within the CEA are quantified in **Table 5.1-3** above.

Utility Production and Distribution

The predominant landscape altering disturbances would be the proposed EEC project, the WPES, the Egan Range Wind Generating Project, and the SWIP Corridor project. Additional projects that would likely impact Native American archaeological sites, in addition to those projects listed above, would include the SNWA water pipeline project, the UNEV pipeline, and other large ground disturbing projects. These projects are discussed in detail in **Section 5.2.4** above.

5.11.5 Cumulative Disturbances

As shown in **Section 5.2.5**, approximately 120,382 acres of the CEA has been disturbed by past and present activities, not including grazing. Quantifiable reasonably foreseeable disturbances, including the EEC would add another 87,331 acres of disturbance for a total disturbance in the CEA of approximately 313,713 acres or slightly more than 16 percent. This does not include land lost to community development and private ownership. Cumulative disturbances to water, vegetation, and wildlife are presented in **Sections 5.2**, **5.7**, and **5.8**. Mitigation has been included with the Proposed Action and Action Alternatives which is protective of the resources.

5.11.6 Cumulative Effects

There are potentially 64 culturally and/or geographically significant areas identified within or in proximity to the EEC CEA (Bengston 2007); not all of these have verified locations but rather identified general vicinities. These areas include traditional use areas, habitations, battle sites, burials, ceremonial areas, and areas associated with traditional stories. The commitment of

approximately 7,070 acres of public land for the proposed EEC and approximately 1,500 acres of public land for the WPES, in addition to the other projects and developments in the CEA (**Appendix 5A**), would constitute a cumulative effect to Native American tribes that claim the region as their traditional use area. As Steptoe Valley is modified through construction of industrial complexes associated with energy development and the population growth that will accompany that, it would change the rural/natural setting that currently exists. This may affect the relationship of the Tribes to the landscape. The cumulative impact on the landscape from multiple projects would be greater than from the EEC project alone.

The continued modification of the landscape through numerous regional projects that impact culturally and/or geographically important places or modify the Tribes' visual relationship to the landscape can have a cumulative impact on Native Americans. However, how this cumulative impact affects the Tribes or the individual over time is unknown and difficult to quantify.

5.12 Land Use

5.12.1 CEA Boundary

The CEA boundary for land use includes Elko, White Pine, Nye and Lincoln Counties, and a portion of northern Clark County. The total area of this CEA is 36,664,882 acres.

Rationale

Cumulative effects to land use are closely associated with socioeconomics. The majority of lands in the affected counties are federally owned. Shifts in land ownership (such as the sale of public lands into private ownership) and changes in land management (such as wilderness designations) not only indicate shifts in land use, but also indicate shifts in socioeconomic drivers.

Elko, White Pine, Nye, and Lincoln counties consist of predominantly federally owned land; are rural; have relatively low populations and economic activities; and contain most of the proposed facilities. Two federal laws passed in recent years direct changes in federal land ownership and management within Lincoln County. A bill recently passed by Congress will provide similar provisions for White Pine County. For these reasons, evaluation of cumulative effects to land use within these counties is appropriate and relevant to this environmental analysis.

The Clark County Comprehensive Plan divides the county into different planning areas. The proposed southern terminus of the transmission line and the Harry Allen Substation are located within the Northeast County Planned Land Use Area of Clark County. Socioeconomic effects from the proposed project have been evaluated as negligible for Clark County because the City of Las Vegas so overwhelmingly affects the socioeconomics of the county. For these reasons, only the portion of the county that contains the project (the Northeast County Planned Land Use Area) is contained within the CEA for land use.

5.12.2 Introduction

Figure 5.12-1 depicts the CEA for land use. County and BLM land use plans for the lands, and land use within the Desert NWR and the Pahranagat NWR, encompassed by the CEA would be the same as those described in **Section 3.12** for the Proposed Action.

The 1.5-million acre Desert NWR and the 5,380-acre Pahranagat NWR fall within the CEA for land use. Both areas are managed by the USFWS, who "...works with others to conserve, protect, and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people."

Historically, the predominant use of the lands within the CEA was for ranching/grazing and the extractive industry. The public lands administered by the BLM within the CEA are managed for multiple use including grazing, hunting, recreation, and extractive industries. More recently, energy industry developments have led to an increase in utility production and transmission infrastructure. Over the past 10 years, federal legislation has been enacted directing sale of public lands to private interests and establishment of designated wilderness. Proposed community developments would expand residential communities into previously rural, undeveloped areas.

The past, present, and future disturbances with cumulative impacts to land use discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.12.3 Past and Present Disturbances

Current land ownership and uses within the land use CEA are presented in **Tables 5.1-1** and **5.1-2,** respectively.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

In addition to the mining districts adjacent to or within the project ROWs (**Table 3.3-2**), there are 30 mining districts along with oil and gas exploration activities within the CEA. For cumulative effects related to minerals, see **Section 5.3**. Excavated areas of sand and gravel occupy 1,157 acres, less than one percent of the CEA.

Federal Legislation Governing Land Use

Five laws enacted by Congress within the past 10 years directly affect the land use within the CEA. **Table 5.12-1** outlines the requirements of the various pieces of legislation.

TABLE 5.12-1. RECENT ENACTED FEDERAL LEGISLATION AFFECTING LAND USE AND REALTY

ACT TITLE, YEAR	ACT PROVISIONS
Southern Nevada Public Lands Management Act of 1998	Within the CEA for land use, the SNLMA: • First piece of legislation establishing authority for retention of land sale proceeds by BLM, State and County for various uses (Ensign 2008a).
Lincoln County Lands Act of 2000	• Disposal of over 13,000 acres of public land • Retention of a portion of the proceeds by the State for general education; • Retention of a portion of the proceeds by the County with an emphasis on support for schools • Retention of a portion of the proceeds by the BLM in special accounts to be used for inventory, evaluation and protection and management of unique archaeological resources; development of a multi-species habitat conservation plan; reimbursement of the State and County for costs associated with sales; and for acquisition of environmentally sensitive land (GPO 2008).

ACT TITLE, YEAR	ACT PROVISIONS
Clark County Conservation of Public Land and Natural Resources Act of 2002	Within the CEA for land use, the CCCPLNRA: • Established the Arrow Canyon, Jimbilnan, Jumbo Springs, Lime Canyon, Muddy Mountains, and Pinto Valley Wilderness Areas • Released Wilderness Study Area lands on the southeast boundary of the Desert NWR, contiguous with the Arrow Canyon, Muddy Mountains, and Lime Canyon WAs, and south of the Lime Canyon WA. • Expanded the boundary of the SNPLMA to include 22,000 additional acres identified for disposal, with retention of proceeds for conservation initiatives within Clark County. • Transfer of land parcels from the BLM to the USFWS and NPS for administrative jurisdiction (BLM 2008).
Lincoln County Conservation, Recreation, and Development Act of 2004	• Disposal of up to 90,000 acres of public land • Retention of a portion of the land sale proceeds by the State for the educational fund • Retention of a portion of the proceeds by the County for economic development • Retention of a portion of the proceeds by the BLM in special accounts to be used for inventory, evaluation and protection and management of unique archaeological resources; development of a multispecies habitat conservation plan; reimbursement of BLM costs associated with sales; for management of the Silver State Off-Highway Vehicle Trail; and for management of the wilderness designated by the act. • Designation of nearly 770,000 acres of wilderness. • Release of over 245,000 acres of wilderness study area • Establishment of utility corridors for the Southern Nevada Water Authority and the Lincoln County Water District, and relocation of an existing utility corridor along US-93. • Designation of the Silver State Off-Highway Vehicle Trail • Conveyance of nearly 5,000 acres of BLM land to the State and County for use as parks and open space • Transfer of administrative jurisdiction for over 8,000 acres associated with the relocated utility corridor from the USFWS to the BLM, and transfer of over 8,500 acres of land from the BLM to the USFWS near the Desert NWR (Ensign 2008b).
White Pine County Conservation, Recreation and Development Act (WPCCRDA) of 2006	• Disposal of up to 45,000 acres of BLM lands • Designation of approximately 558,000 acres of wilderness • Release of over 54,000 acres of wilderness study areas • Allow for land transfers to protect areas around Great Basin NP and expand two Nevada State Parks • Conveyance of approximately 1,750 acres of BLM lands to White Pine County for airport and industrial park expansion • Study of an off-highway vehicle trail • Transfer of lands into trust for the Ely Shoshone Tribe • Amendments to the SNPLMA • Funding of All-American Canal Projects, in return for which Nevada would be guaranteed the right to divert and consume a portion of water from Lake Mead (Ensign 2008c).

In general, the above legislation resulted in transfer of ownership of public lands to private interests, along with the designation wilderness areas and release of some wilderness study area lands. Conversion of Wilderness Study Areas to designated wilderness assured permanent protection for the wilderness values for the areas, with no change to existing land use as wilderness study areas are managed as wilderness until final determination is made. The

release of wilderness study area lands would have freed the lands under study for broader multiple use.

Grazing

For the most part, grazing appears to be in conformance with established BLM RMPs and standards. Substandard conditions on a few allotments, created largely by historic grazing use rather than current use, are being addressed to bring allotments into conformance with plans and standards. For cumulative effects related to grazing, see **Section 5.9**.

Industrial Development

The Apex Industrial Park represents concentrated industrial development within the CEA. Because of the location of the park, it is surrounded by open space and removed from other potentially conflicting uses, such as recreation or communities.

Utility Production and Distribution

Existing electric utility production and distribution systems within the CEA for land use include the Harry Allen Generation Station, Crystal Substation, Chokecherry power line, Falcon to Gonder transmission project, numerous transmission lines to and from the Harry Allen Generating Station, Lincoln County Power District transmission line, Gonder to Machacek transmission line, SPPC transmission line, and the Mount Wheeler transmission line. All existing transmission lines appear to be within established utility ROWs.

Summary

Past and present land uses within the CEA for land use appear to be in accordance with BLM land use plans or county zones or land use designations.

5.12.4 Foreseeable Future Disturbances

Future disturbances to land use are quantified in **Table 5.1-3** above.

Community Development

Residential/community development on private land in the Coyote Springs area (described in detail in **Section 5.2**) deviates from the other surrounding and historic land uses in the area. This development would represent a shift in land use in the future. However, this development is consistent with the comprehensive plans for Clark County. The transmission lines for the EEC, within the SWIP Corridor, would lie between the Coyote Springs development and within the Desert NWR, a prominent land use in the immediate vicinity of Coyote Springs. Development of the residential area and the SWIP Corridor would result in three very different land uses occurring in immediate proximity to each other. While these land uses are not necessarily incompatible, they could detract from one another.

Another residential community, Hidden Valley, to be developed on a 914-acre ranch would be located near Moapa, Nevada. The community would include a small commercial center surrounded by over 4,000 homes. Home sites would range from half-acre lots up to multi-family homes with 18 units per acre. The property is adjacent to the Reid Gardner power plant. Nevada Power Company raised concerns about the development limiting future economic growth through industrial development because of the proximity of the proposed residential development to the power plant (Moapa Valley Progress 2006).

Federal Legislation Governing Land Use

The five pieces of federal legislation listed in 5.12.3 above provided for release of BLM land for sale into private ownership. While sale of some tracts has been accomplished or is underway, future sales of lands under these laws would continue to result in shifts land use into the future.

Industrial Development

As described in **Section 5.2.4** above, approximately 6,000 acres of lots are available for sale within the 21,000-acre Apex Industrial Park. The number of acres currently disturbed is unknown. The intent is for further development of industry within the park, which would be compatible with existing uses, and thus would have no adverse impact on land use.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities (mining or oil and gas development) would involve some road construction and drilling in selected areas, and would have negligible adverse impacts on land use. However, should economic feasibility of resource development improve in the future, additional impacts to land use could occur. As extractive operations increase in acreage and legislated land sales reduce availability of public land for recreational activity, conflicts in land use could result. Permits issued by the BLM for planned mining, oil, and gas exploration assure that future exploration and development would be consistent with BLM RMPs.

Railroad Development

Reconstruction and use of the NNRy would cross 15 grazing allotments and could affect access of livestock to all areas of these allotments and lead to land use conflicts such as collisions between trains and livestock. Long-term use of the NNRy is intended to increase commercial and industrial development north of Ely which would be a change to the existing agricultural land use.

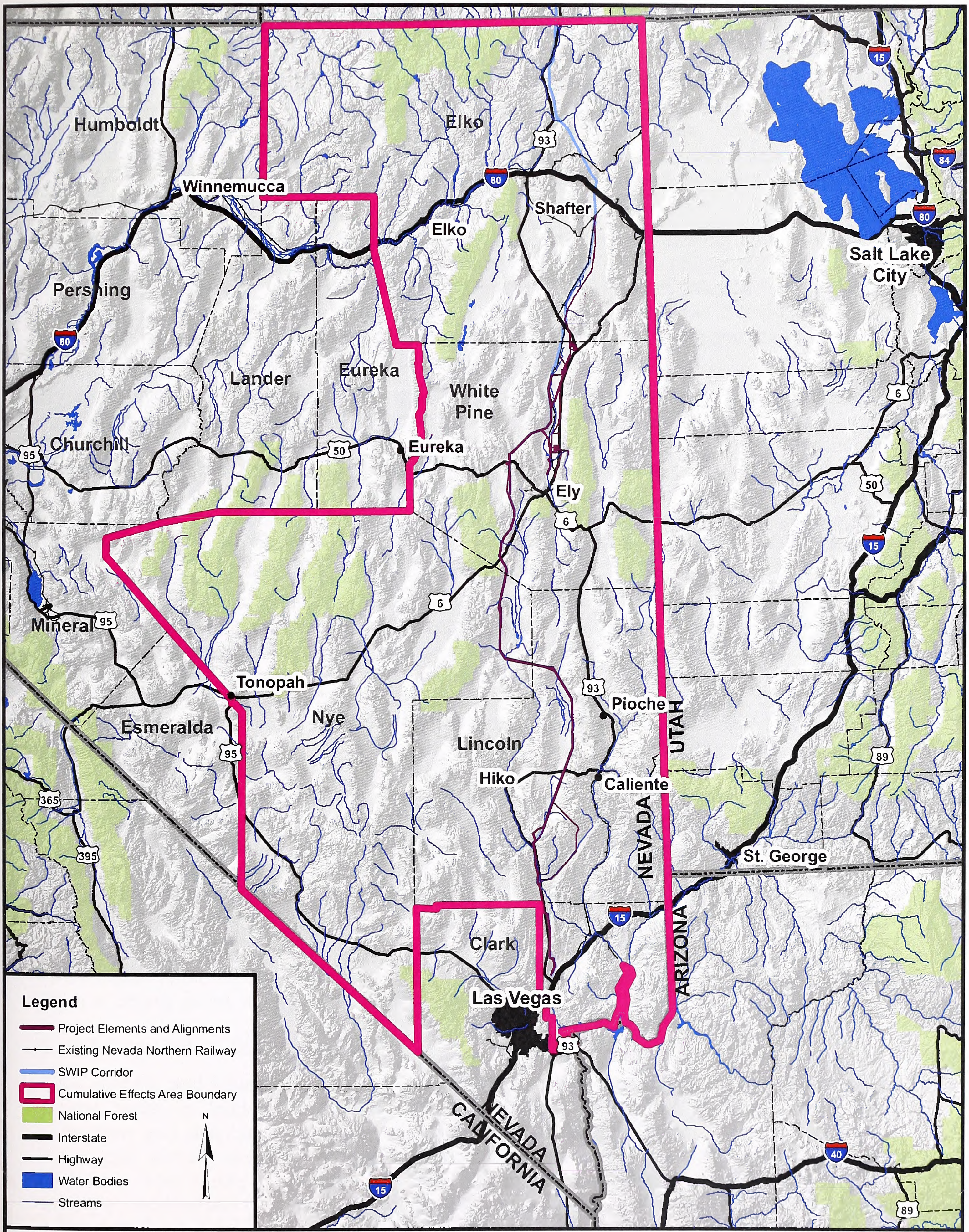
The proposed railroad to serve a geologic repository at Yucca Mountain (for the storage of nuclear waste) would transect the project area and the CEA for land use. The proposed railroad would bisect 27 grazing allotments within the CEA for land use (USDOE 2007a). Creating division within grazing allotments could lead to conflicts in use in those areas, such as collisions between trains and livestock.

Recreation

Increased White Pine County population would lead to increased recreational use of public lands in the County and in the vicinity. Increased recreational use could lead to increased use conflicts on those lands. Additionally, the Desert NWR is proposing to develop a visitor center to improve visitor services, increase wildlife-dependent recreational opportunities, and protect unique natural, cultural and historical resources. A new visitor facility could result in increased public use of the NWR. New visitor facilities could result in both beneficial and adverse effects to land use. Increased public use could lead to increased land use conflicts. However, increased public contact and information could enhance environmentally responsible use of public lands.

Utility Production and Distribution

Development of the WPES in White Pine County, along with associated infrastructure and transmission lines, would result in the sale of approximately 1,300 acres of federal lands into private ownership. Installation of various electric transmission lines, water supply lines, and



Source - Base Map: ESRI and National Atlas of the United States

1:3,400,000

40 0 40 Miles

60 0 60 Kilometers

Scale is 1:3,400,000 when printed at 8.5"x11"

FIGURE 5.12-1
CUMULATIVE EFFECTS AREA
LAND USE
ELY ENERGY CENTER

petroleum product lines within the SWIP and other utility corridors (discussed in greater detail in **Section 5.7** above) within the CEA would affect surface land uses, such as grazing, to a minor extent in the short term, and to a very limited extent in the long term. Utility developments identified within the CEA appear to be consistent with county land use plans and BLM RMPs. Together these developments would result in a slight reduction in federal land ownership and a shift away from grazing uses.

A compatible use is defined by the USFWS as "...a proposed or existing use of a national wildlife refuge that, based on sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge" (USFWS 2007c). The established SWIP Corridor runs through both the Desert NWR and the Pahranagat NWR; therefore development of future utility transmission facilities within the corridor is considered a compatible use.

Future identified development of transmission and other utility lines within established utility corridors includes the WPES/GBT transmission line, Harry Allen-Mead transmission line, SNWA transmission line, Lincoln County Power District transmission line, SPPC/NPC transmission lines, and the TransCanada transmission lines. These identified developments would be consistent with planned uses for the corridors. Future addition of the transmission lines associated with the Proposed Action and the Action Alternatives, as well as other proposed transmission and pipelines would compliment existing land uses in the Apex Industrial Park.

Sithe Global Power LLC's proposed development of the Toquop Energy Project, a 750-MW coal-fired electric power plant with a natural draft cooling tower, located 14 miles northwest of the City of Mesquite, Nevada in Lincoln County, providing electrical power to utilities in Nevada. The electric power-generating facility would be located on a 640-acre parcel of land. The plant would average 812 construction workers for the 4-year construction period, and 110 full time operations personnel (Toquop Energy Project 2007). A 2003 BLM Record of Decision on the Toquop Project approved a proposed 1100 MW natural gas fired power plant and its associated components (land, water delivery infrastructure, transmission line). The proposed modification to fuel the plant with coal is based on the increased cost of natural gas and improved environmental controls for coal fired utilities. The new proposal would require additional land for storage of combustion by-products (e.g. ash) and a 31-mile railroad spur for coal delivery. The previously approved plant was granted 2,100 acre-feet per year of the 7,000 acre-feet per year of water needed to run that plant; the Nevada State Engineer was studying the availability of the additional 4,900 acre-feet per year requested (Toquop Energy Project 2007).

Summary

Foreseeable future land uses within the CEA appear to be in accordance with BLM land use plans or county zones or land use designations.

5.12.5 Cumulative Disturbances

Past, present and future land use appears to be in accordance with BLM land use plans, or county zones or land use designations. Past, present, and future development of utility production and distribution facilities, along with residential development, potential extractive (mine, gas, and oil) development, and legislated land sales would result in a trend shifting land ownership from public to private, and land use away from past uses such as grazing to industrial. Additionally land sales would reduce public lands available for recreation and other public use.

The CEA for land use totals 36,664,682 acres. Within the CEA for land use, known quantifiable past and present disturbances total approximately 460,590 acres. Proposed future disturbances would potentially disturb another approximately 87,331 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to land use within the CEA would be 653,921 acres, which is approximately 2 percent of the total area of the CEA.

5.12.6 Cumulative Effects

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future land uses, cumulative adverse effects to land use are expected to be long-term and negligible to minor, resulting largely from sale of public lands and increased potential for use conflicts.

5.13 Special Designations

5.13.1 CEA Boundary

The CEA boundary for Special Designations includes an area within a 50-mile radius of developments and 50 miles either side of linear features (e.g. transmission lines and pipelines). The total area of this CEA is 23,881,598 acres.

Rationale

As stated in **Section 4.13**, analysis of impacts to special designations is from the perspective of people utilizing SDAs. Impacts to SDAs should not be noticeable beyond this area (i.e., people using SDAs outside of the identified CEA would not likely perceive impacts from the Project).

5.13.2 Introduction

The CEA for special designations is depicted in **Figure 3.13-1**. There are 64 SDAs within the CEA, established by the federal or state government to protect wilderness, wildlife habitat, and other recreational, ecological or historical values. Special designations within the CEA are described in detail in **Section 3.13**.

Depending on proximity of SDAs to disturbances, impacts to the areas can be from visual or air quality degradation, or noise. Projects within the CEA could result in adverse impacts to air quality through ground disturbance and emissions, or create visual or auditory disturbances. When combined with the effects of the Proposed Action or Action Alternatives, these projects could affect qualities managed for within the Special Designations that are found in the CEA.

The past, present, and future disturbances with cumulative impacts to SDAs discussed below are described in detail in **Section 5.2.3** and **5.2.4**.

5.13.3 Past and Present Disturbances

Current land ownership and uses within the special designations CEA are presented in **Tables 5.1-1** and **5.1-2**.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Existing extractive industry uses within the CEA may impact SDAs. Open pit mined areas are susceptible to wind erosion and can impact air quality and visibility. Mining, oil, and gas exploration involve road construction and use of drilling equipment. Construction has short-term impacts through increased road dust, and the visual intrusion of the equipment. Long-term effects would result from the presence of roads on the landscape.

Grazing

Existing grazing uses throughout the CEA should have little effect on SDAs. Grazing uses can result in dust that would adversely affect air quality and visibility, but the effects would be localized in areas of degraded range conditions and susceptible to wind erosion.

Industrial Development.

The Apex Industrial Park containing utility infrastructure, landfills, quarries, and manufacturing could impact SDAs a couple of ways. The power plants produce emissions that in the long term would affect SDAs that lie within a 10 to 15 mile radius of the plants, as well as SDAs down wind. Disturbed areas are susceptible to wind erosion and could impact air quality and visibility down wind in the long term.

Utility Production and Distribution

Existing transmission lines west of US-93 may be in the view shed for the Delamar Mountains WA, and would clearly be visible from within the Desert NWR.

5.13.4 Foreseeable Future Disturbances

Disturbances to SDAs are quantified in **Table 5.1-3** above.

Community Development

Development of the residential areas of Coyote Springs and Hidden Valley (described in detail in **Section 5.7** and **5.12.4** above) could impact down-wind SDAs in both the short and long term. Short-term effects would result from construction dust and emissions impacting air quality and visual resources. Long-term effects would result in visual disturbance from the density of development, and adverse impacts to air quality from residents motor vehicle use. Both developments would create new or additional light sources in the area, potentially affecting dark night skies, but those effects would be incremental to the effects of the City of Las Vegas and its suburbs. Construction or operation of transmission lines associated with the proposed action or its alternatives would not be anticipated to contribute to these cumulative effects to dark night skies.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Future development of mining and gas and oil leases could impact air quality and visual resources through ground disturbance and distribution of dust particles in the air during construction. Long-term impacts to air quality and visual resources could result should mineral resources be developed within claims, resulting in establishment of new mines, or expansion of existing surface mining operations.

Industrial Development

Sale of remaining lots and full development of the approximately 6,000 acres available within the Apex Industrial Park could increase emissions and dust affecting visibility, and could result in increased population affecting recreational use of SDAs in the area.

Recreation

Increased White Pine County population would lead to increased recreational use of public lands in the county and in the vicinity. Increased recreational use would likely lead to increased contact between persons using remote and wilderness areas, and potentially increased opportunity for degradation of natural conditions. Additionally, the Desert NWR is proposing to develop a visitor center to improve visitor services, increase wildlife-dependent recreational opportunities, and protect unique natural, cultural and historical resources. A new visitor facility could result in increased public use of the NWR.

Utility Production and Distribution

Development of additional transmission lines and other development within the SWIP in particular could impact SDAs. Any construction of transmission lines or underground pipelines could impact air quality and thus, visibility in the short term. Long-term effects from transmission line development within the SWIP could include visual impacts in proximity to SDAs.

Development of the WPES would result in short-term impacts to air quality and visual resources from ground disturbance and emissions from construction. In the long term the facility itself would be visible in the surrounding area, emissions would impact air quality, visibility and visual resources, and night lighting of the facility would impact dark night skies. These effects would combine with the effects of the EEC to impact SDAs in the immediate vicinity and down wind of the power plants.

As discussed in **Section 5.15.4** below, wind generators would introduce large scale visual disturbances on the landscape of Steptoe Valley, potentially visually impacting SDAs in the vicinity.

5.13.5 Cumulative Disturbances

The special designations CEA totals 23,881,598 acres. Within the CEA for special designations, known quantifiable past and present disturbances total approximately 353,023 acres. Proposed future disturbances would potentially disturb another 67,500 acres, including 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to special designations within the CEA would be approximately 526,523 acres, which is approximately 2 percent of the total area of the CEA.

Light Pollution

Given the magnitude of the two proposed power plants in Steptoe Valley, and their relative proximity to each other, their combined night glow would adversely impact dark night skies. It would be expected to be noticeable in SDAs located in immediate proximity to the power plant locations, including the Bristlecone and High Schells WAs, and the North-South Schells RNA under the Proposed Action, Becky Peak and Goshute Canyon WAs under the North Plant Site

Alternative. The FAA-required lighting on the wind turbines of the Egan Range Wind Generating Project and the lighting required for the stacks and nighttime operation of the WPES and EEC would add man-made light sources to the night skies. This new light source could potentially impact dark night skies in the South Egan Range and Mount Grafton WAs. There would be a cumulative light impact to the generally unpolluted night sky for these SDAs.

Changes to Ambient Air Quality

Section 5.6 of this EIS discusses air quality and visibility degradation due to the construction and operation of the EEC power plant in conjunction with other projects in the Air Quality CEA. Evaluation of past and present projects is contained within analysis of the existing ambient air conditions, and discussed in conjunction with impacts of the EEC on SDAs in **Section 4.13.2.1**.

Sections 5.6.6.1 and **5.6.6.2** describe ambient air quality impacts from the Proposed Action and its alternative, to include future projects, most notably, WPES. The same analysis approach described in **Section 4.13.2.1** was used for cumulative impact analysis.

Based on information provided by the BLM, cumulative impacts to air quality in SDAs within a 45 to 90 km radius of the proposed plant sites within the CEA would be long-term and would comply with applicable NAAQS. Cumulative effects to air quality of SDAs from transmission lines in conjunction with other construction in nearby areas within the CEA would be short-term and negligible. Cumulative effects to air quality of SDAs from railroad operation in conjunction with other projects would be long-term and negligible.

Changes to Viewsheds

The stack and boiler from the EEC would be visible within a broad area of Steptoe Valley, as would the WPES (described in detail in **Section 5.15**). Other new visual intrusions in the vicinity of the power plants would include transmission lines (both associated with the EEC and WPES, and those installed in conjunction with the SWIP and WWEC). These visual developments would expand the visual intrusion of human development on the natural scene primarily for Goshute Canyon, Becky Peak, Bristlecone, and High Schells WAs, the Pony Express Trail, and for the Cleve Creek Baldy RNA.

In the southern portion of the CEA, cumulative visual effects to SDAs would occur to the Desert NWR, Delamar Mountains, Meadow Valley Range, and Arrow Canyon WAs, and the Mormon Mesa and Kane Springs ACECs from increased development within the SWIP/WWEC combined with the Coyote Springs community development. Utility corridor development would contribute a short-term impact on visual resources if the infrastructure were underground (pipelines). Above ground transmission lines would contribute a long-term impact. Future development, in conjunction with transmission lines in the Apex Industrial Park area would increase the density of development in the area, potentially making it more visible from Coyote Springs ACEC, and the Arrow Canyon and Muddy Mountains WAs. Such development could contribute both short-term (construction) and long-term (permanent structures) visual impacts.

Changes to Noise Levels

Because of the distance between both the proposed South and North Plant Sites and the WPES, there is not anticipated to be any overlap of noise effects from the two power plants. Cumulative noise effects to the Goshute Canyon, Becky Peak, Bristlecone, and High Schells WAs, and the North-South Schells RNA would result from the cumulative effects of construction and increased worker traffic in the short term, and power plant operation along with increased

permanent power plant staff traffic in the long term. Increased noise effects may be noticeable in some nearby SDAs at certain times, depending on wind direction and speed; however, those effects would not be expected to be a prominent disturbance in the natural setting.

Changes in Recreation

The northern section of the CEA in Elko, White Pine, and northern Lincoln counties would likely see increases in recreational use of SDAs from the population influx associated with construction and operation of the two new power plants. Those SDAs located in closest proximity, or more easily accessed from the developed population centers (Goshute Canyon, Becky Peak, Bristlecone, High Schells and Mount Moriah WAs; North-South High Schells and Cleve Creek Baldy RNAs; and Great Basin NP) would likely see the most intensive recreational use.

5.13.6 Cumulative Effects

Table 5.13-1 indicates which SDAs within the CEA would experience either temporary or permanent impacts to various aspects of the SDA. Those SDAs not listed in **Table 5.13-1** would experience no or negligible effects.

TABLE 5.13-1. CUMULATIVE IMPACTS TO SDAS

SPECIAL DESIGNATION AREA	LIGHT POLLUTION	AIR QUALITY & VISIBILITY	VISUAL	NOISE	RECREATION
Arrow Canyon WA			X		
Becky Peak WA	X	X	X	X	X
Bristlecone WA	X	X	X	X	X
Delamar Mountains WA			X		
Goshute Canyon WA	X	X	X	X	X
High Schells WA	X	X	X	X	X
Meadow Valley Range WA					
Mormon Mountains			X		
Mount Grafton WA	X				
Mt. Moriah WA					X
Muddy Mountains WA			X		
South Egan Range WA	X				
Arrow Canyon ACEC					
Coyote Springs ACEC			X		
Hidden Valley ACEC					
Kane Springs ACEC			X		
Mormon Mesa ACEC			X		
Desert NWR			X		
Cleve Creek Baldy RNA			X		X
Mt. Moriah RNA					
North-South Schells RNA	X	X		X	X
Great Basin NP	X	X			X
Pony Express NHT	X	X	X	X	X

5.14 Recreation

5.14.1 CEA Boundary

The CEA boundary for Recreation is the same as for Special Designations.

Rationale

Recreation impacts should not be noticeable beyond this area (i.e., people recreating outside of the identified CEA would not likely be impacted from the Project).

5.14.2 Introduction

Figure 3.13-1 depicts the CEA for recreation. Existing recreational use within the CEA is generally dispersed and light, and includes activities such as hiking, primitive camping, horseback riding, OHV use, hunting and fishing. In addition to dispersed recreational use, within the CEA there are 32 developed federal and state recreational use areas. Descriptions of dispersed and developed recreational opportunities and associated recreational management plans for areas within the CEA are discussed in detail in **Section 3.14**.

The primary land uses within the CEA are grazing, utility production and transmission, and extractive activities (mining, gas and oil leases). These land uses all have the potential to affect the quality and quantity of recreational activities within the CEA by affecting the actual acreage available for recreation; or visual impacts such as transmission lines, air pollution or disturbances associated with extractive industries. The transient workforce associated with project construction would increase the areas population and would likely introduce different cultures that may use recreational resources differently from the existing culture of the rural area. While the area for dispersed recreation is expansive, developed recreation sites are limited in scope and capacity. With increased population, users of dispersed recreation areas may experience more encounters with other recreational users. Increased levels of recreational use may increase competition for access to developed facilities. Thus, increased levels and different types of recreational use increases the potential for use conflicts that can reduce the quality of recreational experiences.

The past, present, and future disturbances with cumulative impacts to recreation discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.14.3 Past and Present Disturbances

The current land ownership and uses for (thus disturbances within) the recreation CEA can be found in **Tables 5.1-1** and **5.1-2**.

Federal Legislation Governing Land Use

Five pieces of federal legislation resulted in the sale of BLM lands and the establishment of numerous wilderness areas. Provisions of this legislation are discussed in detail in **Section 5.12** above. Sale of BLM lands would effectively reduce the amount of public lands available for recreation. Conversion of Wilderness Study Areas to designated wilderness assured permanent protection for the wilderness values for the areas, with no change to existing recreational resources.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Past and present extractive activities include approximately 30 mining districts, and numerous oil and gas exploration leases within the CEA. Lands occupied by extractive activities have reduced recreational value, or may reduce acreage available for recreation when vegetation and/or wildlife are adversely affected. Development of roads associated with mining, gas and oil exploration can enhance recreational use of an area by improving access.

Utility Production and Distribution

Past and present disturbance associated with utility infrastructure includes existing power plants, transmission lines, and underground pipelines within designated corridors. Lands occupied by utilities infrastructure are no longer available for recreation.

5.14.4 Foreseeable Future Disturbances

Future disturbances to recreation are quantified in **Table 5.1-3**.

Expanded Recreation Facilities

The Desert NWR has released a Draft Environmental Impact Statement for development of visitor facilities within the Refuge. Existing visitor use facilities do not provide adequate capacity or opportunities to inform visitors about recreational opportunities and increased visitation is anticipated to further strain existing facilities. New facilities would include a visitor center and administrative complex, along with associated roads and parking areas (USFWS 2007b).

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities exploration (mining or oil and gas development) is possible in the future, and would minimally adversely impact recreation. However, should economic feasibility of resource development improve in the future, adverse impacts to recreation could increase.

Federal Legislation

The five pieces of federal legislation listed in **Section 5.12.3** provided for release of BLM land for sale into private ownership. While sale of some tracts has been accomplished or is underway, future sales of lands under these laws would continue to result in relatively slight reductions of public lands available for recreation in the future.

Utility Production and Distribution

In addition to construction of the proposed EEC, construction of the proposed WPES would result in an influx of temporary workers. The effect of increased population would be most evident in the northern portion of the CEA, in White Pine County, where the existing population is relatively small. An influx of temporary workers would also utilize recreational resources in the southern portion of the CEA; however, these effects would be overshadowed by recreational use by people living in the Las Vegas area.

Developed recreational outlets, particularly those in proximity to the plant sites, would see increased visitation and more intensive use due to population increases associated with

construction and operation. Existing developed campgrounds on federal lands generally are designed to accommodate 10 or fewer parties (publiclands.org 2008). Increased use could mean that facility users recreate in a more heavily used setting, encountering other users and different types of use. User conflicts over the limited number of developed facilities, and adverse impacts to the resource/facilities from intensive use could result. Increased dispersed use within the CEA could make it more difficult to recreate without encountering other people, or experiencing human effects. Increased transient population could result in higher demand for hunting permits, and thus increased competition for limited resources, traditionally utilized by the long-term or permanent residents of the area. Increased transient population could also result in increased illegal hunting that could adversely impact wildlife conditions, further adversely impacting hunting.

Future addition of transmission lines within designated corridors would result in towers supporting transmission lines occupying acreage, thus reducing acreage available for recreation. Future rights-of-way granted for transmission lines could include exclusive access provisions, reducing or eliminating recreational access to certain areas.

Consolidation and development of utility transmission lines within identified corridors (such as the SWIP) reduces potential cumulative effects to recreational resources from utility infrastructure as multiple entities could use the same access roads for construction as well as line maintenance.

5.14.5 Cumulative Disturbances

Grazing, development of utility infrastructure, and extractive industry would have minimal effect on recreation within the CEA as the proportion of lands impacted by these uses in comparison with lands available for recreation is relatively small. Cumulative adverse effects to recreation would primarily result from increased and different types of use of recreational resources within the CEA. Effects of increased population and recreational use of public lands are increased by the sale of BLM lands. Increased use of recreational resources would result in varying kinds of uses that may conflict with each other, increased competition for limited developed facilities creating potential user conflicts, and could potentially result in degraded quality of recreational experiences and resources from intensive use. The effects of increased use would be felt primarily in the northern portion of the CEA, resulting from the population increase associated with power plant construction and operation. However, the proportion of lands available for recreation is far greater than the potential increases in recreational use or lands to be sold into private ownership.

Quantification of acreages of past, present and anticipated future disturbances to recreation would be the same as those described for special designations in **Section 5.13.5**.

5.14.6 Cumulative Effects

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future disturbances with the potential to impact recreation, cumulative effects to recreation are expected to be long-term and minor to moderate.

5.15 Visual Resources

5.15.1 CEA Boundary

The CEA boundary for visual resources is the same as described for surface water (**Figure 5.2-1**).

Rationale

This boundary was chosen for simplicity purposes and the fact that vantage points from which the Proposed Action and Action Alternatives, and other past, present, and reasonably foreseeable disturbances can be discerned are roughly contained within these areas.

5.15.2 Introduction

The CEA is within a region of generally north- to south-trending mountain ranges and valleys. Scenic variety exists in the topography and densities, arrangements, and colors of vegetation found in the CEA. The VRM of the BLM lands within the CEA are generally Class III or Class IV with small intermittent areas of Class I and II. The VRM designations (proposed in Ely BLM district) that exist within the CEA are shown in **Table 5.15-1**.

TABLE 5.15-1. BLM VISUAL RESOURCE MANAGEMENT (VRM) DESIGNATIONS IN THE CEA

VISUAL QUALITY OBJECTIVE	ELKO DISTRICT (ACRES)	ELY DISTRICT (ACRES)	SOUTHERN NEVADA DISTRICT (ACRES)	TOTAL ACRES	PERCENT OF BLM IN THE CEA
Class I	-	94,009	4,285	98,294	5.64
Class II	13,423	248,107	799	262,330	15.06
Class III	40,242	639,902	76,650	756,794	43.46
Class IV	-	351,693	24,432	376,125	21.60
Unknown	-	-	-	247,849	14.24
Total	53,665	1,333,711	106,166	1,741,392	100.00

Source: BLM 2008a (RMP)

The past, present, and future disturbances with cumulative impacts to visual resources discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.15.3 Past and Present Disturbances

The current land ownership and uses for (thus disturbances within) the visual resources CEA would be the same as those described for surface water resources in **Tables 5.1-1** and **5.1-2**.

Visual disturbances within the CEA are fairly minimal and generally include roads, mining, agriculture, sparse residential development, and utility corridors. Past and present disturbances have visually altered approximately five percent of the CEA. Burned areas and agricultural areas are more or less visually acceptable; burned areas if occurring as a natural wildland event are noticeable, but typically are not perceived as man-caused or intrusive development. Agriculture is a common land use in the area, and visually is part of the historic and present landscape. Past and existing mining operations are generally not visible within the CEA, except for the KCC tailings area.

The City of Ely and the State Prison, both located in the south portion of Steptoe Valley, project light into the night skies (**Section 3.15.3.4**).

5.15.4 Foreseeable Future Disturbances

There are several reasonably foreseeable projects with the potential to impact the visual environment in the CEA by adding industrial man-made features to the landscape. Future disturbances to visual resources are quantified in **Table 5.1-3**.

Agriculture, Forestry, and Similar Sources of Surface Disturbance

The proposed Toano fuel break would burn about 400 to 667 acres of vegetation along I-80 and SR-233. However, this area is outside the CEA and should not be visible with the CEA.

Community Development

Coyote Springs would develop 43,000 acres of land, of which 12,000 acres is slated for green space. However, the development would create a visual change in an area currently undeveloped.

Railroad Facilities

Rehabilitation of the NNRy would increase its visibility as vegetation is cleared during reconstruction. However, the NNRy is generally a surface feature without high profile features. Train traffic would draw attention to the feature.

Utility Production and Distribution

The WPES power plant cooling towers (550 feet tall), stacks (600 feet tall), and boilers (300 feet tall) would be visible for long distances and from many locations in Steptoe Valley. The associated transmission lines (towers 120-200 feet tall) would also be seen from various locations, but would be less intrusive than the WPES facility itself.

The Egan Range Wind Generating Project, proposed to be located along the top of Egan Range on the west side of Steptoe Valley, would be visible along different portions of the valley. Turbines (140-328 feet tall towers) and transmission lines associated with this project would introduce large-scale visual elements.

Numerous transmission lines, including those proposed to be located within the SWIP Corridor (encompasses the WWEC and BLM Utility Corridor through the CEA), would also add large-scale man-made elements to the landscape. The transmission facilities within the SWIP Corridor would be noticed mostly where it parallels in close proximity or crosses transportation routes such as US-93.

The FAA-required lighting on the wind turbines of the Egan Range Wind Generating Project and the lighting required for the stacks and nighttime operation of the WPES would add man-made light sources to the night skies.

5.15.5 Cumulative Disturbances

The EEC power plant would add high-profile man-made elements to the landscape that would be visible from long distances. The EEC would add a new 3,000-acre industrial facility to the generally undeveloped landscape setting of Steptoe Valley. Similar to the WPES, the stack (700+ feet tall), boilers (280 feet tall), and other structures (70 to 125 feet high) would be visible for long distances and from many locations in the valley. The associated transmission line towers would range from 100 to 185 feet in height. The EEC and the WPES would both be visible within the landscape from certain areas of Steptoe Valley. These projects could also

have an effect on visibility in Steptoe Valley because of exhaust gases and dust produced (see **Section 5.6**).

Exterior lighting associated with the proposed power plants (EEC and WPES) would require exterior lighting that is adequate for safe and efficient operation, and these lights have potential to affect the quality of the night sky. The tower lighting required by FAA for the wind turbines (Egan Range Wind Generating Project) would further introduce light into the area.

Quantification of acreages of past, present, and anticipated future disturbances to visual resources would be the same as those described for vegetation in **Section 5.7.5**.

5.15.6 Cumulative Effects

Considering the relative remoteness and natural state of Steptoe Valley, the reasonably foreseeable projects combined with the EEC would represent a substantial cumulative impact to the character/scenic integrity of the landscape. Co-location of utility rights-of-way and communication sites into designated corridors (i.e. SWIP, BLM Utility Corridor, WWEC) would serve to lessen impacts.

Further, nighttime skies in Steptoe Valley would be cumulatively affected by exterior lighting associated with these projects, even after implementing mitigation measures. There would be a cumulative light impact to the generally unpolluted night sky.

5.16 Noise

5.16.1 CEA Boundary

The CEA boundary for noise is the same as described for surface water (**Figure 5.2-1**).

Rationale

Noise from construction is quickly attenuated by distance, vegetation, and topography. Noise related to construction and operation of the power plant, road and rail traffic, and transmission line construction is of importance to human receptors along these areas. All of these noise sources are contained within the CEA boundaries.

5.16.2 Introduction

The CEA encompasses the broad Steptoe Valley, which is deep enough to minimize most cross range noise transport, and generally wide enough to attenuate all but high volume sources of noise across its width. Tight canyons or other features that could concentrate sound exist along the valley walls, but those features typically do not feature sensitive receptors in areas where noise from current or foreseeable sources could be concentrated.

Section 3.16 documents current noise levels in Steptoe Valley and its vicinity. **Section 4.16** documents the noise anticipated to be generated by the Proposed Action and Action Alternatives, and the impacts to local residents and on areas of human activity in the vicinity. This cumulative effects analysis assesses anticipated noise levels and impacts within the CEA based upon foreseeable activities within or potentially affecting that area.

The past, present, and future disturbances with cumulative impacts to noise discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.16.3 Past and Present Noise Sources

The current land ownership and uses for (thus disturbances within) the noise CEA would be the same as those described for surface water resources in **Tables 5.1-1** and **5.1-2**.

Noise measurements documented in **Section 3.16** describe current noise levels. Those measured values include the impacts of all current noise sources.

Background noise levels in rural areas in the CEA, including along rural roads identified in the vicinity of the proposed project location in Steptoe Valley, were measured to be in the 30 dBA L_{eq} range. Noise levels away from the isolated noise sources are low level, typically dominated by natural sources including winds. In areas of concentrated residential or urban development, like Ely and McGill, local noise generation sources combined with slower moving traffic typically result in noise levels in the 50 to 60 dBA range. In smaller communities or along roads with moderate traffic volumes, current noise levels are estimated to be in the 40 to 50 dBA L_{eq} range based upon measurements documented in **Section 3.16**.

Aircraft

Air traffic impacts are generally isolated to near the vicinity of the Ely Yelland Field airport. Takeoffs and landings generate brief but loud local impacts. Air traffic over Steptoe Valley is generally light, with small planes at altitudes that generate only brief impacts comparable to road traffic volumes. Crop spraying can generate higher impacts from low flying planes, but if those efforts occur it would be infrequently during late spring and summer.

Community Development

As described in **Section 3.16**, the most prominent noise impacts in the CEA result from transportation sources and urban or residential sounds generated in areas of higher population density. Background noise measurements in Steptoe Valley indicate values consistent with rural areas with low population density. Natural sound sources including wind represent a significant portion of observable noise, and average noise volumes are at or below 30 dBA L_{eq}, comparable to sound levels within a typical residential home. **Table 3.16-2** documents roadside noise readings at levels near the 30 dBA L_{eq} alongside lesser traveled roadways. Maximum measured noise levels approached 60 dBA L_{eq}, alongside busier stretches of road, comparable to conversational voice levels at six feet but below FHWA noise mitigation levels for residential areas.

The Ely and McGill urban areas concentrate traffic and other noise sources associated with human activity and commerce. Noise from in town traffic, business activities, and residentially generated sounds ranging from mowing to human and pet noises combine to elevate in town noise levels above those measured alongside local roads. Traffic is slowed by lower speed limits and safety considerations in these areas of concentrated development. Similar but smaller magnitude effects are observed in the smaller communities in the CEA, with human activity and commerce increasing noise levels slightly above those measured alongside nearby roadways.

Isolated noise sources exist across the CEA. The non-industrial sources are governed by county nuisance laws. Noise generation is generally low enough that effects are localized, and the noise generated is not sufficient to impact residential areas or areas of regular human activity at rates higher than roadway traffic. Examples of such sources include the Robinson Mine, restaurants, cafes, bars, retail outlets, and water pumping stations. Regional construction and maintenance efforts include the use of heavy construction equipment with the potential to

generate noise levels of up to 95 dBA L_{eq}, typically affecting any developed areas for short durations.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Isolated noise sources across the CEA have localized noise impacts that typically affect few residences or areas of human activity. Eleven mines were listed as operating in White Pine County in 2006. The Robinson Mine outside Ruth is the only one in the CEA with production levels sufficient to list among the major mines of Nevada in 2006 (Driesner and Coyner 2007).

Industrial Development

Impacts of public noise sources are generally controlled by county noise ordinances. Transient construction efforts occur at least intermittently across the CEA. No long-term stationary construction efforts are currently underway in the CEA.

Railroad Facilities

Rail traffic currently generates noise impacts at the northern extent of the CEA, with the UPRR traversing east to west through Shafter. Sound generated by current rail traffic along the UPRR through Shafter elevates current noise levels within ¼-mile of those tracks.

5.16.4 Foreseeable Future Noise Sources

The following section documents foreseeable sources of noise potentially affecting the CEA in addition to those described in **Section 4.16** from the EEC. The nature of those foreseeable actions and their actual or potential noise are discussed below. Impacts associated with those actions are discussed in **Section 5.16.6**, Cumulative Effects.

Foreseeable changes from current noise emission patterns are expected to include growth in rail traffic once a rail link is established with the EEC project and/or the WPES. Other foreseeable changes include potential local and regional growth in auto, truck, and/or air traffic, proposed mining ventures, and construction efforts and/or changes in emissions from industrial sources identified as currently existing.

Airport Expansion

The proposed Yelland Field airport expansion could increase the localized area of moderate air traffic noise impacts locally, and lead to noticeable increases in noise levels along approaching and departing flight paths. New or extended runways would expand the area where people could potentially be exposed to noise from incoming and departing planes. If the expansion included longer runways, they could allow for larger planes to come in and out. The frequency and duration of exposure to noise could also be increased if the airport expansion has the desired effect of increasing air traffic volume. The most significant effects of an airport expansion would be felt in the areas in the immediate vicinity of the airport, including where it would expand, and for at least a few miles along preferred flight paths into and out of Yelland Field.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Hard rock mining is expected to remain a strong and vibrant part of the regional economy, with operating mines hoping to maintain the production pace that resulted in record production volumes in 2006 (the last year for which comprehensive statistics are available). Six proposed mines in Nye County have either just completed their permitting and approval process or anticipate final decisions by 2008. The Barrick Bald Mountain Mine in western White Pine County is anticipating a final decision from the BLM on its planned expansion in 2008. The larger regional mines have documented their noise generation and impacts through National Environmental Policy Act (NEPA) analysis during their authorization efforts.

Railroad Facilities

A cumulative look at railway transport emissions would also include engine noise the full length of transport, from the mine to the energy center, though the act of mining the coal effectively ensures transport to the final user or distribution center. The direct impact of noise associated with rail transport from the UPRR junction at Shafter to the EEC is included in **Section 4.16**. Coal could come from a number of sources, and that a conservative assumption used for the cumulative effects analysis is that the coal would come from the Antelope Mine in the Powder River Basin of Wyoming. Noise generation analyses assume an average speed of 37 miles per hour over the generally open 985 mile train route from the Antelope Mine to the UPRR line, slightly higher than the 33 mile per hour average speed assumed for the local trains from Shafter to the EEC.

Traffic & Transportation

EEC project traffic projections estimate increases in traffic volumes on US-93 north and south of McGill and on local arterials like the Cherry Creek Road to increase by 33 percent per decade (HDR et al. 2007). At least 10 road improvement projects are planned in the CEA, focusing on US-93 and local arterials SR-318 (Sunnyside Road), Ely Colony Route 102, and Forest Road 23 along Duck Creek. Those efforts should maintain dependable road service along most project area roadways. Those improvements in traffic flow would generally maintain or enhance average travel speeds. Higher travel speeds or more traffic would generally increase noise levels along the affected roadways, though that effect could be offset if the traffic features smaller vehicles.

Utility Production and Distribution

The proposed WPES in Steptoe Valley and associated development represents the one prominent foreseeable industrial noise source in the CEA other than noise sources associated with the proposed EEC. The Proposed Action or Action Alternatives would result in a noise profile similar to that described for this project in **Section 4.16**. The proposed WPES would be located between the EEC's preferred South Plant Site and the North Plant Site Alternative. Onsite noise emissions described in the WPES's DEIS indicate an energy center with 1500 MW generating capacity would generate a very similar noise pattern as predicted for the proposed 1500 MW EEC, including noise generated by train traffic from Shafter to the project's energy station location.

5.16.5 Cumulative Noise Sources

Section 4.16 of this EIS documents the anticipated direct and indirect impacts of the proposed EEC.

5.16.6 Cumulative Effects

Impacts of the Proposed Action and Action Alternatives, primarily driven by construction, and operation of the EEC and associated rail traffic to support the EEC, are described in **Section 4.16**.

The most prominent foreseeable industrial project in Steptoe Valley would be the WPES. That project would include a 1500 MW coal-fired power production center with rail transport of coal from the UPRR rail line near Shafter, similar to the Proposed Action of this EIS. The EIS for the WPES documents moderate noise impacts localized around the proposed energy station and along the rail lines from Shafter to the proposed WPES. Noise generated onsite at the WPES during construction would be attenuated down to background levels within approximately eight miles of the facility. During operation, it would be attenuated down to background levels within seven miles. Those impact areas would not overlap with the noise impacts of the EEC during construction or operation because of the approximately 14 miles between the two facility locations. The impacts of the EEC would overlap with those of the WPES only along the rail lines from Shafter to the WPES location and its impact zone another few miles south. The net effect would be more frequent train passages that would be loud near the tracks. Rail line owners would strive to increase business along the rail lines in Steptoe Valley, potentially increasing rail traffic above the combined use levels anticipated to serve just the EEC and the WPES. Because the noise impact scale is logarithmic, overall rail traffic volumes of two to three times the rail activity predicted from this project on the rail lines from the WPES north to Shafter would increase predicted average noise impacts predicted for the Proposed Action by approximately 2 to 3 dBA L_{eq}, assuming the speed of the other trains was comparable to the 33 miles per hour predicted for the EEC trains. Between the proposed WPES and the South Plant Site, the average noise impact of the rail line would increase by approximately 2 dBA L_{eq} if rail traffic volume from other sources equaled rail traffic volume to and from the South Plant Site. In the immediate vicinity of the WPES, the maximum impact of that facility predicted in that project's EIS would be 53 dBA L_{eq}. The 1.4 round-trip train passages per day associated with the EEC South Plant Site would increase average noise impacts in the vicinity of the WPES by 2 to 5 dBA L_{eq} above the maximum impact predicted for that facility alone. The resulting maximum noise impacts in the vicinity of the WPES would still be below 60 dBA L_{eq}, moderate in intensity, but well below levels recommended for mitigation for highway projects.

Traffic volumes in the vicinity of the South Plant Site are forecasted to increase by approximately 33 percent per decade. Road maintenance projects should maintain smooth flow of traffic along US-93 and across most regional arterial roads. Those trends would be expected to lead to an increase in traffic noise generation of approximately 2 to 3 dBA L_{eq} by 2030 along US-93 and roads where the Proposed Action or Action Alternatives would generate increased travel. The EEC and WPES would lead to sharp short-term increases in population during their construction phases. Though no formal projections are known, air traffic is likely to remain near current levels or possibly to increase slightly. Foreseeable actions are therefore anticipated to result in increases in noise impacts along US-93 and local arterial roads that would remain below the FHWA mitigation level of 67 dBA L_{eq}. Air travel impacts would likely change little from the present, and little change in residential or urban noise generation or impact except for the increases described in close proximity to US-93 and local arterial roads.

Mining activities would continue to have localized impacts. Record 2006 mining production in Nevada and the numerous new ventures seeking approval to commence operations nearby could cause expanded mining activity in and around the general area, though the mining industry has historically proven to be cyclical. Expanded mining activity would have localized noise impacts within the CEA.

Across the CEA, noise impacts would be expected to remain below national average levels in most areas. No point of human activity would be expected to have routine noise levels reaching the 67 dBA L_{eq} level at which the FHWA recommends mitigation for road projects.

5.17 Socioeconomics

5.17.1 CEA Boundary

The CEA for socioeconomics includes Elko, Lincoln, and White Pine, Nye and Clark counties (**Figure 5.17-1**). In-depth analysis was only performed for Elko, Lincoln, and White Pine counties for reasons stated below and in **Section 4.17.1**. The total area of this CEA is 35,118,276 acres.

Rationale

The power plant would be constructed in White Pine County under either alternative utilizing a rail line from Shafter in Elko County to provide coal to the EEC. The majority of power plant employees would likely live in White Pine County. Lincoln County lies south of White Pine County and would be within commuting distance of the EEC. These counties are rural, have relatively low populations and economic activities, and contain most of the proposed facilities, with the exception of a portion of transmission line in Nye County and the southern terminus of the transmission line at the Harry Allen Substation in Clark County. Nye County is not included in the impact analysis as only a small portion of the transmission lines pass through the county and there would be negligible local socioeconomic impacts. Clark County is not included in the impact analysis for socioeconomics as impacts to Clark County would be negligible and a cumulative impact would be indiscernible compared to the existing and future economic activity in the county driven by the growth of the Las Vegas urban area. Additionally, including the economic activity in this cumulative impact analysis would artificially reduce the significance of the overall economic impact of the project on the three main counties that would be impacted.

5.17.2 Introduction

The social and economic structures and relationships that are in place in the three main counties of the CEA are described in **Section 3.17**. Along with the description in **Section 3.17**, the analysis presented in **Section 4.17** of the EIS includes a detailed discussion of the potential direct and indirect social and economic impacts of the Proposed Action and Alternatives, including No Action, for the CEA.

The past, present, and future disturbances in regards to cumulative impacts to socioeconomics discussed below are described in detail in **Sections 3.17** and **5.2.4**.

Land ownership within the socioeconomics CEA is presented in **Table 5.1-1**.

5.17.3 Past and Present Disturbances

The past and present disturbances as related to the socioeconomics of the three main counties of the CEA are discussed in detail in **Section 3.17**.

5.17.4 Foreseeable Future Disturbances

Community Development

Proponents for the Coyote Springs development project as many as 240,000 residents at full build-out in 30-40 years. The development would encompass 14,000 acres in Clark County and 29,000 acres in Lincoln County and include golf courses, conservation areas, and 150,000 homes. A development of this magnitude, if constructed, would have a substantial impact on the economics of Lincoln County and a moderate impact on Clark County. Proponents would first have to obtain enough water rights to support the development (see **Section 5.2.4**).

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

As discussed in **Section 5.2.4**, interest in oil and gas exploration and production has increased in the project area and the socioeconomic CEA. This interest, coupled with increasing commodity prices that may make previously abandoned mineral mines profitable in the future, have the potential to trigger a new economic "boom" cycle in the CEA.

Federal Legislation

Several Congressional actions have the potential to promote economic growth in Lincoln, Clark and White Pine counties. As noted in **Sections 3.17**, **4.17**, and throughout this document, land in Lincoln and White Pine counties, in particular, is over 90 percent federal in ownership, which limits economic development. The Southern Nevada Public Lands Management Act of 1998; the Lincoln County Lands Act of 2000; the Clark County Conservation of Public Land and Natural Resources Act of 2002; the Lincoln County Conservation, Recreation, and Development Act of 2004; and the White Pine County Conservation, Recreation and Development Act of 2006 all direct transfer of federal lands to private, tribal, state, county or local sectors. In addition to freeing federal lands for development, these acts allow proceeds from land sales to benefit tribal, state, and local governments.

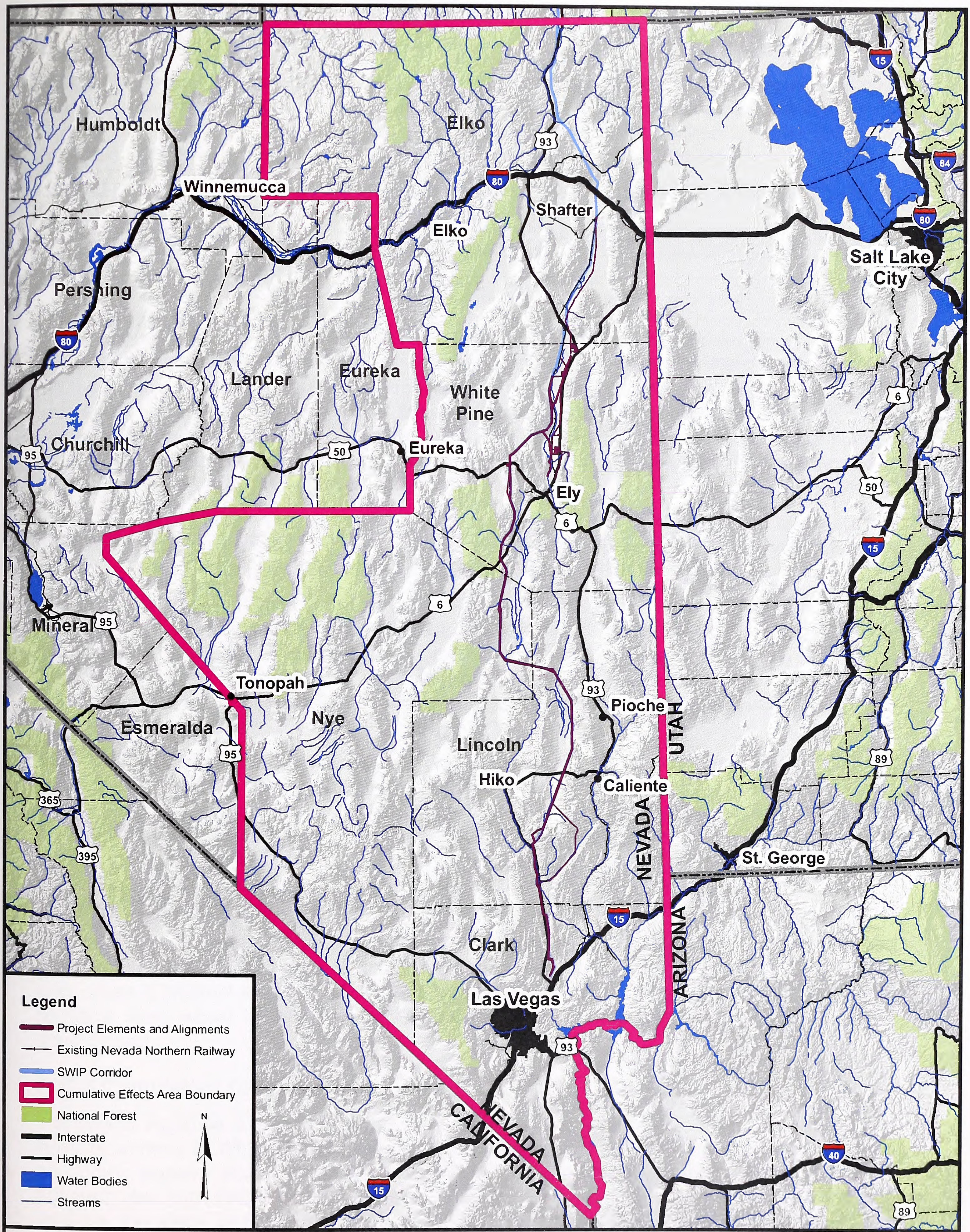
Another likely economic benefit of the above noted legislation is associated with conservation and wilderness areas, which generate tourism and contribute to an area's quality of life. The Lincoln County Conservation of Public Land Natural Resources Act of 2002, for example, designates 770,000 acres of wilderness, and the White Pine County Conservation, Recreation, and Development Act of 2006 designates 558,000 acres of wilderness.

Utility Production and Distribution

The proposed EEC would contribute effects on public services beyond existing levels as there would be a temporary increase in the White Pine County population of up to 26 percent during construction.

In addition to the EEC, there are three other potential projects in the three-county area that would contribute to cumulative social and economic effects. The largest of these is the WPES. Secondly, Sithe Global Power LLC is developing the Toquop Energy Project. The third project for consideration is the SNWA Groundwater Development Project to be located in White Pine, Lincoln, and Clark Counties.

The direct employment involved in constructing the EEC is estimated to average approximately 1,390 workers over the life of the construction project (**Table 5.17-1**). The WPES would have a



Source - Base Map: ESRI and National Atlas of the United States

1:3,400,000

40 0 40 Miles

60 0 60 Kilometers

Scale is 1:3,400,000 when printed at 8.5"x11"

FIGURE 5.17-1
CUMULATIVE EFFECTS AREA
SOCIOECONOMICS
ELY ENERGY CENTER

workforce of about 760 persons (BLM 2007e) while the Toquop Energy Project would employ a construction workforce of about averaging 500 over the 26-month construction period (Toquop Energy Project 2007). The Groundwater Development Project planned by the SNWA is projected to have an average workforce of about 240 persons (SNWA 2007).

TABLE 5.17-1. CUMULATIVE DIRECT EMPLOYMENT IMPACTS (# OF ESTIMATED EMPLOYEES)

	CONSTRUCTION	OPERATIONS
Ely Energy Center	1,390	180
White Pine Energy Station	760	135
Toquop Energy Project	500	110
SNWA Groundwater Development Project	240	N/A
Totals	2,890	340

Each of these major construction projects slated for east-central Nevada would increase the permanent workforce in the area. The total workforce associated with operating the three power plants in the area is estimated to be about 340 persons. The workforce necessary to operate the SNWA Groundwater Development Project is unknown, but the permanent workforce should be fairly small.

The WPES would be the project that coincides the most with the EEC and would contribute the most to cumulative impacts. The WPES is scheduled for construction in approximately the same time period as the EEC and is also located in Steptoe Valley north of McGill.

The Toquop Energy Project would be located in the southern part of Lincoln County, approximately 180 miles south of Ely and 80 miles northeast of Las Vegas. Although it would be located in the CEA considered for social and economic impacts, it would have very little impact on White Pine County. The social and economic impacts arising from the Toquop Energy Project would be concentrated in the southern portion of Lincoln County and extend south into Clark County.

The SNWA Groundwater Development Project is slated for development in six different groundwater basins in Clark, Lincoln, and White Pine Counties. Construction in the different basins would be staged and occur at different times. The construction crews building the Groundwater Development Project would be located at different locations during the life of the project, according to what phase is being built at the time. Construction is scheduled to begin in 2009 and continue through 2018. Work in the Spring Valley, the area closest to Ely is scheduled for the first quarter of 2010 through the first quarter of 2016.

The SWIP and the WWEC are two major utility corridors through eastern and southern Nevada (see **Section 5.2.4**) that would facilitate economic and population growth in the CEA, rather than cause it (indirect impacts). During construction of individual transmission lines within the corridors there would be brief population and economic increases, but negligible long-term direct impact.

5.17.5 Cumulative Disturbance

The WPES would be a coal-fired power plant similar in size to the EEC and would generate an influx of workers to White Pine County. The developers of the WPES are planning to provide temporary workers accommodations, similar to the workers village planned for the EEC. Although the proponents of both facilities are making arrangements to house construction workers, the influx of the workforce necessary to build both power plants would result in a temporary demand for housing in White Pine County.

The WPES would generate approximately $74.7 million in tax receipts for the various government entities in White Pine County (BLM 2007e). This includes an estimated $51.6 million in sales/use taxes and $23.1 million in property taxes. The operations of the WPES will generate 8.2 million annually for White Pine County ($6.6 million in property taxes and $1.6 million in sales/use taxes). When added to the approximately $15.9 million in property tax revenue from the EEC during operations, total property tax revenue in White Pine County may increase by about $22.5 million annually. For comparison, projected property tax revenue for White Pine County for the 2006-2007 tax year was $8.4 million (Nevada Department of Taxation 2006b).

The Toquop Energy Project will generate an estimated $14 million in sales/use taxes for Lincoln County. No estimate of potential property tax impacts is available for Toquop. When the facility is fully operational, sales/use tax payments received by Lincoln County are estimated at $390,000 annually. The estimated annual property tax attributed to the project is $7.0 million. The amount of property tax that would be disbursed to Lincoln County is not available (Toquop Energy Project 2007). Since the SNWA is a government agency, the Groundwater Development Project would be exempt from property tax and property that the SNWA has purchased in Spring Valley for the Groundwater Development Project has been removed from the tax roles. This represents a decrease of approximately $20,000 in annual property tax payments to White Pine County and the amount may increase to up to $50,000 in subsequent years. Discussions are underway for the SNWA to possibly compensate White Pine County with payments in-lieu of taxes (Las Vegas Review-Journal 2007b).

5.17.6 Cumulative Effects

The cumulative effects of the EEC Project in conjunction with other upcoming projects would strain resources in the area such as schools, medical facilities, and housing during the construction phases. Mitigation, such as the worker villages and tax collections, would greatly reduce these strains. The EEC proponents plan to enter into a cooperative agreement with White Pine County and other local agencies to study the potential social and economic impacts of the EEC on local services and infrastructure and develop mutually agreeable mitigation measures.

Once construction of the EEC and WPES were complete and the facilities were operational, there would be a permanent addition to the workforce, employment, and income of White Pine County. This would aid in insulating the area from the cyclical nature of the metal mining industry. Further, the EEC would add to employment and economic stability within the CEA that result from an additional industry in an area historically dependant on mining, agriculture, and tourism. Operation of the EEC would result in additional diversification of the east-central Nevada economy and help insulate the area against the traditional boom-bust cycles due to heavy dependence on the metal mining industry.

5.18 Environmental Justice

As discussed in **Sections 3.18** and **4.18**, minority populations of Native Americans were identified as residing in or near the project area, concentrated primarily on the Goshute, Ely, Duckwater, and Odgers Ranch Reservations. In addition, Lincoln County was identified as having a meaningfully greater percentage of individuals and families living at or below the poverty level than the general population of the State of Nevada. For the purpose of cumulative effects analysis, impacts from the combined operations of the EEC and the WPES were

considered to determine if they would constitute a disproportionate adverse impact on any of these minority or low income populations.

As for analysis of direct and indirect effects of the EEC in **Section 4.18.2.1**, CEQ and EPA guidelines for environmental justice compliance were applied with the following results:

- Geographically, no concentrated minority population (e.g., Goshute, Ely, Duckwater, South Fork (Odgers Ranch), Elko, Wells, and Duck Valley Indian Reservations) would be directly impacted (no project facilities on or through the reservation)
- Economically, overall impacts would be positive, not adverse
- Tribes have had, and continue to have, opportunity to participate in project discussions, through the public participation process, as a Cooperating Agency (Goshute Reservation), and in solicited requests (see **Sections 3.11** and **4.11**)
- Both the Human Health Risk Assessment and the Screening Level Ecological Risk Assessment (Tetra Tech 2008a, Tetra Tech 2008b) found that the combined projects (EEC and WPES) with all boilers operating simultaneously would not adversely affect any modeled receptors, including receptors at the Goshute, Ely and Odgers Ranch Reservations
- The population of the poor in Lincoln County are not concentrated in any geographically identifiable area, and, as for the minority populations, would not experience any disproportionate adverse effects from the project, during construction or operations.

In general, the area is rural. The area is within the traditional use area of Native Americans and dispersed casual use may continue (**Section 5.11** Native American Concerns). The analysis of environmental justice is affected by the incremental effects of employment, income, governmental revenue, and other social and economic characteristics that may change over time. No disproportionately high and adverse impacts to an environmental justice population were identified under past, present, or the reasonably foreseeable future developments for the Proposed Action or Action Alternatives. Therefore, the overall projected effects of this project to identified minority and low income populations are beneficial impacts resulting from increased economic opportunity, as discussed in **Section 5.17** Socioeconomics.

5.19 Hazardous and Solid Waste Materials

5.19.1 CEA Boundary

The CEA for hazardous and solid waste materials includes all landfills impacted by the Proposed Action and Action Alternatives (no figure).

Rationale

Hazardous and solid waste generated by the Proposed Action and Action Alternatives would be handled and disposed of either at on-site landfills or transported by contractors to other permitted landfill facilities.

5.19.2 Introduction

This section provides an inventory of existing or reasonably foreseeable facilities that generate, treat, transport, or dispose of solid or hazardous waste in the immediate vicinity of the proposed

project, and any landfills that may be impacted by the Project. **Section 3.19** describes current conditions of hazardous and solid waste within the project footprint. **Section 4.19** describes in detail the substances, or their hazardous criteria, that would be used by the EEC facility during construction or operation, and how those substances would be managed in compliance with all applicable state, federal, and local regulations.

Solid and hazardous waste materials that would be generated through air deposition are discussed in sections focused on air quality (**Section 3.6**, **Section 4.6**, and **Section 5.6**). Chemicals used for agricultural applications are not considered here.

5.19.3 Past and Present Disturbances

The City of Ely has a licensed Class I municipal landfill for solid waste (WPCC 2006). This landfill has capacity to accept the solid waste generated during construction and operation of the EEC, along with other local sources. Class II landfills (low volume facilities) were formerly located in Baker, Cherry Creek, Eight Mile Community, Lages, Lund/Preston, Moorman Ranch, Preston, and Schellbourne; an open dump for medical waste was located in Ely (NDEP 2007d). These were removed and are not covered in the White Pine County Solid Waste Management Plan (WPCC 2006).

The US EPA (2007b) totals 886 underground injection wells for all of Nevada. Twelve of those are Class II wells (brines and other fluids associated with oil and gas production and with hydrocarbons for storage); one is a Class IV well (hazardous or radioactive wastes into or above an underground source of drinking water [USDWs] – these are banned except when authorized by a federal or state ground water remediation project); and the rest are Class V wells (generally non-hazardous fluids into or above USDWs and are typically shallow, on-site disposal systems) (EPA 2007c). Data are not available on specific locations, owners, depths, or character of the waste.

There are five commercial facilities in the region of the EEC that can accept various types of waste that might be generated at the site.

NDEP lists only one facility licensed to dispose of RCRA hazardous waste in the State of Nevada, which is U.S. Ecology in Beatty. In addition, NDEP lists two private Treatment, Storage, or Disposal (TSD) facilities and two federal TSD facilities (NDEP 2007b). U.S. Ecology also operates a hazardous waste disposal facility at Grand View, Idaho, about 70 miles southeast of Boise. This facility accepts hazardous waste, industrial waste, and low-level radioactive waste. Clean Harbors LLC operates the Aragonite Incinerator facility about 34 miles west of Grantsville in western Utah. It also operates the Grassy Mountain hazardous waste landfill about 80 miles west of Salt Lake City, Utah. Both of these facilities also accept industrial waste.

Energy Solutions operates the Clive landfill about 80 miles west of Salt Lake City. This facility accepts low-level radioactive waste and mixtures of such waste with hazardous waste.

Table 5.19-1 shows the EPA Toxic Releases Inventory (TRI) database for White Pine County for 2005, the most recent year for which the database is available. Only two facilities in the county are among the industries required to report these data to the EPA, and both are outside the CEA (EPA 2007e). Note that the term “release” in the TRI program includes permitted emissions and discharges; wastes managed in regulated disposal facilities; and accidental spills and releases. “On-site releases” are those emitted to the air, disposed of on-land, or discharged to surface waters or underground injection wells. “Off-site releases” are wastes that

are shipped off-site for management in regulated disposal facilities (NDEP 1998b). The U.S. National Library of Medicine (NLM) TOXMAP shows no TRI Reporting Facilities in the EEC project area, including transportation and transmission corridors (NLM 2007).

TABLE 5.19-1. TOXIC RELEASE INVENTORY FOR WHITE PINE COUNTY, NEVADA, 2005 (EPA 2007E)

FACILITY	CHEMICAL	TOTAL ON-SITE DISPOSAL OR OTHER RELEASES (LBS)
BALD MOUNTAIN MINE		**725,452**
	Hydrogen Cyanide	8,200
	Lead Compounds	666,782
	Mercury Compounds	49,670
	Methyl Tert-butyl Ether	800
ROBINSON NEVADA MINING CO		**20,580,912**
	Ammonia	820
	Chromium	72,010
	Dioxin & Dioxin-Like Compounds	0.0014994
	Lead Compounds	20,179,034
	Manganese	52,018
	Nickel	67,010
	Nitrate Compounds	210,010
	Nitric Acid	10
TOTAL		**21,306,364**

The EPA (2007d) database for White Pine County shows seven conditionally exempt small quantity generators (generating less than 220 lbs RCRA waste in any single month), two transporters of RCRA waste, one small quantity generator (generators of 220 to 2,200 lbs of RCRA waste in any single month), and one "used oil program" facility. The quantity and character of wastes generated by small and conditionally exempt generators is not reported.

The EPA (2005c) shows 8,863 tons of RCRA hazardous waste interstate shipments from Nevada, and 50,072 tons of RCRA hazardous waste interstate receipts for 2005. The state's five RCRA hazardous waste receivers accepted 61,996 tons of material in 2005 (EPA 2005c). Specific routes, transportation corridors, or modes of transportation (e.g. truck, rail) were not reported.

The NLM (2007) shows no Superfund or National Priority List sites in the project area or CEA. The NDEP Bureau of Corrective Actions (NDEP 2007d) shows two active leaking underground storage tank (LUST) sites in White Pine County and five non-LUST sites, all of which were for petroleum product releases (e.g., diesel, gasoline, motor oil). The same source shows 76 closed sites where clean-up and/or remediation have been completed (NDEP 2007d). These sites include some leaks to soil and/or groundwater which occurred during transportation (mobile), buried lines that were dug up, and Brownfields (Old White Pine County Landfill). A number of these sites are within the CEA.

5.19.4 Foreseeable Future Disturbances

Reasonably foreseeable generators of solid and/or hazardous waste in the CEA include the construction/development of the WPES along with the reconstruction of the NNRy. Proponents

of the WPES have stated that the facility and its contractors (during both construction and operational phases) would comply with all state, federal and local regulations relevant to the handling and disposal of all wastes (BLM 2007e). This includes construction and operation of utilities within the SWIP Corridor, substation, and other facilities.

The U.S. Department of Energy (USDOE) Preferred Alternative for the Proposed Action for a new rail line to transport radioactive waste to the proposed repository at Yucca Mountain crosses the SWIP Corridor in Lincoln County (USDOE 2007b). Construction of the rail line is expected to “increase the overall rate of disposal of solid waste by less than 0.01 percent and industrial and special waste in the region of influence by about 0.261 percent” (USDOE 2007b).

5.19.5 Cumulative Disturbance

As described in **Section 2.2.1.1**, the on-site landfill for combustion by-products would cover 1,000 acres over the 50 years the EEC is in operation. The landfill would be operated in stages or cells, with only one active cell in use at a time. Cells would have crowns of 70 to 100 feet in height with a projected 50-year volume of 89 million cubic yards. The landfill would be a lined, zero-discharge facility, fully compliant with state, local and federal regulations. Each cell would be reclaimed after it is filled and abandoned, capped and vegetated.

All other solid and hazardous wastes generated during the construction phase and during the operations phase of the EEC would be transported to licensed facilities off-site for treatment and disposal. These wastes cannot be quantified at this time with any degree of certainty; however, in the context of existing and foreseeable solid and hazardous waste generation locally and regionally, the EEC would constitute a minimal increase in waste generation and management, well within existing capacities and infrastructure.

5.19.6 Cumulative Effects

Given the existing capacity and regulatory framework for generators, transporters, and TSD facilities, the EEC would have minimal effects on solid and hazardous waste generation and management. As noted in **Sections 3.19** and **4.19**, the EEC would comply with all local, state and federal regulatory requirements.

5.20 Transportation

5.20.1 CEA Boundary

The Transportation CEA consists of the existing transportation routes into the project area including Highways 6, 50, 93, and 318, Interstates 15 and 80 (**Figure 3.20-1**), along with major rail lines and airports.

Rationale

Transportation into the project area would primarily be on these existing and established access routes. Transportation should not be noticeably affected outside of these major roads.

5.20.2 Introduction

The transportation system in and around the proposed EEC Project contains established routes including highways, county roads, local roads, and a railway. Transportation associated with the Proposed Action and Action Alternatives would continue to be along existing routes. The existing transportation routes include paved, graveled, and dirt roads providing access to

communities, industrial areas, utility ROWs, private land, and public lands. The current condition of the transportation system is generally good with a Level of Service (LOS) A designation (free flow, low traffic density, or delay) along US-93 (**Section 3.20**), the main access to the proposed EEC.

The past, present, and future disturbances with cumulative impacts to transportation discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.20.3 Past and Present Disturbances

Past and present developments, such as mining, utility projects, community development, ranching, and recreation, have influenced transportation routes, their improvement, and increased use.

Population Increases

Increases in state and regional populations (**Section 3.17**, Socioeconomics) have contributed to increased traffic and use of the transportation system. The CEA includes segments of the CANAMEX corridor (US-93, I-15), a generally north-south route running from Arizona north into Canada (NDOT 2000). Being designated as a major regional corridor indicates US-93's importance as an interstate and regional route for the transportation of goods in and through Nevada. Recreational use increases (**Section 3.14**, Recreation) have also impacted the area transportation system and likely increased the miles of unimproved dirt roads.

5.20.4 Foreseeable Future Disturbances

Future increases in road use, and subsequent road damage, and road improvements could result in subsequent changes to the LOS designations of roads within the CEA. However, future road improvements could mitigate increased utilization of the transportation system.

Airport Expansion

The Yelland Field Expansion project will allow for the expansion and development of airport facilities in White Pine County, and encourage development of air service and aviation-related industry. Additional air service into the Ely area could result in less long-distance vehicle traffic within the CEA; however, this would be negligible to average traffic volumes on the interstates and highways.

Railroad Facilities

The NNRy is proposed to be reconstructed and upgraded to support economic development in the Ely area. The reconstruction of the railway would provide improved transportation of goods into the area, possibly resulting in less truck traffic on the highways. This would be a beneficial impact. If the NNRy were utilized by the EEC, it is estimated that nine coal trains would travel to the power plant site per week. The use of the NNRy by the WPES would require 12 coal trains per week. Quantity of additional train trips due to other economic development is unknown.

Roads

The NDOT STIP for 2008-2011 and 2008-2017 lists future transportation improvement projects (http://www.nevadadot.com/traveler/construction_projects/STIP/). These include maintenance (resurfacing) projects along US-93 and US-50 and another along Duck Creek Road (**Table 5.20-1**).

TABLE 5.20-1. PROJECTS FROM THE NEVADA PROPOSED HIGHWAY PROJECTS FOR FY2008-2017 AND STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM FOR FISCAL YEARS 2008-2011

PROJECT NUMBER	DESCRIPTION	FY '08	FY '09	FY '10	FY '11	PROJECT SPONSOR
WP200501	FH-23, Duck Creek from US-93 north of McGill for 10.2 miles south.	X	X			Forest Service
WP200609	US-50 from 9.93 miles east of Pancake Summit to 3.28 miles east of Jct. Ruth/ Kimberly Rd.	X				State
WP200711	US-50 at 11.40 miles east of Jct. Rd. to Strawberry (SR-892) and at 4.08 miles east of Jct. Ruth/Kimberly Rd.	X				State
WP200812	US-50 at 4.70 miles east of Robinson Summit. WP 54.40	X				State
WP200813	US-50 at 9.30 miles east of Robinson Summit. WP 59.00	X				State
WP200801	US-93 from Cherry Creek Rd. to US-93A. WP 98.56 to 111.76.	X				State
WP200802, WP200803, and WP200811	US-93 from Jct. US-93A north to the WP/Elko County Line. WP 112.76 to 116.69.	X				State
WP200809	US-93 from 15.39 miles north of Jct. Success Summit Rd. to Jct. US-93A. WP 86.00 to 112.76.	X				State

Source: NDOT 2007a and 2007b

Utility Production and Distribution

Projects that would include a large amount of construction workers and materials, and therefore would increase traffic would include the EEC, the WPES, and the Egan Range Wind Generating Project. Construction of the EEC and WPES would happen concurrently, at least in part, requiring several thousand workers in the area depending on the stage of construction for each project.

5.20.5 Cumulative Disturbance

The transportation network in the CEA in the reasonably foreseeable future would be the same as past and present with no change to existing transportation routes. Project specific access routes would not provide public thoroughfares. Road upgrades and improvements associated with present and future developments would improve the transportation network and make it generally safer. The added traffic during construction and operation of the EEC and the WPES would be noticeable to locals.

The EEC would require 1.3 coal trains to travel the NNRy or private railroad per day (9 per week). An additional 12 coal trains would travel along the NNRy to and from the WPES per week. These train trips may cause some traffic delay at road crossings.

5.20.6 Cumulative Effects

Traffic increases on the transportation network due to construction of the WPES, scheduled to begin in 2008-2009 and expected to continue for 4-5 years (BLM 2007e), would overlap with traffic increases associated with the EEC. There would be a cumulative impact on

transportation due to construction worker traffic and truck delivery traffic. Although there would be an increase in traffic on the entire CEA, the impact would be most noticeable on US-93. The degree and location of this impact would be dependent on which power plant site is selected for the EEC, as the North Plant Site Alternative is 16 miles north and the South Plant Site is 14 miles south of the WPES, respectively, and how many workers travel the same access routes to the construction sites. This cumulative effect would be temporary during construction and would not affect the overall level of service (LOS A) of US-93.

There would be minor impacts to the transportation network in the CEA as it develops to meet the demands of industrial development and increased population. There would be no net increase or decrease in transportation routes as a result of the EEC Project. There would be a general need to expand and improve existing infrastructure to accommodate cumulative regional transportation needs.

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6.1 Public Participation Summary

6.1.1 Public Scoping Period

The public was provided a 30-day scoping period at the beginning of the EIS process to identify potential issues and concerns associated with the Proposed Action. The Notice of Intent (NOI) for the Ely Energy Center Environmental Impact Statement (EIS) was published in the Federal Register on January 26, 2007. A copy of this NOI is included in the Ely Energy Center Scoping Report dated April 30, 2007 (BLM-JBR 2007). A legal notice was published in local newspapers as follows:

High Desert Advocate	West Wendover, NV	January 25, 2007
Ely Times	Ely, Nevada	January 26, 2007
Las Vegas Review Journal	Las Vegas, NV	January 26, 2007
Reno Gazette Journal	Reno, NV	January 26, 2007
Valley Voice	Alamo, NV	February 2007

A press release was sent to media outlets as follows in **Table 6.1-1**.

TABLE 6.1-1. SCOPING PRESS RELEASE DISTRIBUTION

Television Stations		
KCLV TV 2 (City of Las Vegas) KVBC TV 3 CTV-TV 4 (Clark County) KVVU TV 5	KLAS TV 8 LV 1 KLVX TV 10 KTNV TV 13	KFBT TV 33 KVWB TV 21 KFBT & KVWB KLBC TV 2 Laughlin
Radio		
KCEP 88.1 FM KHWY 98-99 FM KNPR 89.5 FM KUNV 91.5 FM KNUU 970 AM KDWN 720 AM KLAV 1230 AM Metro Sky View Traffic KSNE 106.5 FM	KBGO 93.1 FM KWNR 95.5 FM KMZQ 100.5 FM KXTE 107.5 FM KLUC 98.5 FM KSNF 1140 AM KMXB 94.1 FM KXNT 840 AM KOMP 92.3 FM	KXPT 97.1 FM KBAD 920 AM KENO 1460 AM KKLZ 96.3 FM KJUL 104.3 FM KSTJ 102.7 FM KTSJ 105.5 FM KSTAR 102.7 FM KOAS 105.7 FM
Newspapers		
Las Vegas Review-Journal Las Vegas Sun The View Newspapers Associated Press LV Business Press In Business City Life Las Vegas Weekly Bullseye NAFB Boulder City News Laughlin Times LV Sentinel Voice LV Asian Journal North Las Vegas Times-Herald Henderson Home News	Las Vegas Tribune The Business Voice Construction Connection Las Vegas Life U.S. Asian Chronicle Las Vegas Senior Press Nevada Senior World News Senior Spectrum Construction Zone Las Vegas Chinese Daily News Philippine News Jewish Reporter Las Vegas Israelite The Beehive Home & Hearth	Nevada Development Authority High Country News Southern Nevada Home and Garden S, The Magazine of Summerlin 215 South Magazine Urban Water Report Moapa Valley Progress Las Vegas Chamber of Commerce Henderson Chamber of Commerce Urban Chamber of Commerce Latin Chamber of Commerce Asian Chamber of Commerce North Las Vegas Chamber Moapa Valley Progress

Spanish Language Media		
Television Telemundo KBLR TV 39 Univision KINC TV 15 KYRK TV 35 KHDF 19 Azteca LV Newspaper El Mundo Newspaper El Tiempo Libre Latin American Press TV LV	Radio KLSQ 870 AM KQMR 99.3 FM KISF 103.5 FM KDOX 1280 AM KLAV 1230 AM KVBC 105.1 FM KRLV 1340 AM KWID 101.9 FM KDOX 104.7 FM	
Other Media		
Las Vegas Magazine Nevada Business Journal Nevada Magazine Sunset Magazine What's On Magazine Where Magazine of Las Vegas		

A scoping letter was prepared and sent to a list of approximately 1,800 potentially interested individuals, agencies, and organizations. The BLM compiled the initial contact list by using contact lists from previous projects. The intial scoping mailing list is included in the Scoping Report (BLM-JBR 2007).

In addition, a postcard was subsequently mailed to the same list notifying the public of a new e-mail address that was set up to receive public comments.

6.1.2 Scoping Meetings

Five scoping meetings were held at locations around the State of Nevada:

Las Vegas, Nevada	February 5, 2007
Alamo, Nevada	February 6, 2007
Ely, Nevada	February 7, 2007
Elko, Nevada	February 8, 2007
Reno, Nevada	February 9, 2007

All attendees of scoping meetings were asked to sign in and provide their contact information. Lists of individuals who signed attendance sheets at the public meetings are included in the Scoping Summary Report (BLM-JBR 2007). The meetings began each evening at 5:00 PM and continued until 8:00 PM, with a formal presentation at 6:00 PM. The presenting speakers at each venue were the same: Chris Hanefeld and Joe Incardine, BLM, and David Sims, Nevada Power Company. The BLM representatives discussed the meeting structure, how comments could be submitted, and provided an overview of the NEPA process. Mr. Sims presented an overview of the need for the project and a brief description of the Proposed Action.

There were nine information display stations set up at each scoping meeting, with BLM and Nevada Power personnel available to answer questions from the public about the EIS analysis and proposed project, respectively.

Attendees at the scoping meetings were provided with handouts describing the Proposed Action as well as the NEPA process. Comment forms were also provided to all attendees to facilitate submission of written scoping comments. The public was given the option to provide comments during the meeting, using regular mail, or e-mail.

In addition, information regarding the proposed action and the NEPA process is posted on the BLM's project website at:
www.blm.gov/nv/st/en/fo/ely_field_office/blm_programs/energy/energy_projects__transmission.html.

6.1.3 Scoping Response

The 30-day scoping period, during which comments were received, was from January 26 through February 26, 2007. All responses received by BLM were logged, analyzed, and summarized to discern issues of concern. A total of 9,374 letters, emails and faxes were received in response to the request for public comment regarding the Proposed Action. Of those responses, 8,996, or approximately 96%, were a form letter opposing the proposed project. The letter indicates that the signatories for the most part oppose the project on the grounds that the project would use outdated technologies that result in unacceptable health and environmental impacts from pollution and destruction of sensitive landscapes.

In addition to the form letter, 377 unique responses were received from various organizations and individuals. Respondents included businesses, preservation organizations, oil and gas industry, as well as unaffiliated individuals and others. Of the 377 unique responses received, there were approximately 167 non-substantive comment letters that indicated a positive or negative stance, including 16 percent in favor of and 84 percent opposed to the proposed action. Respondents favoring the project generally cited the need for power, energy independence, and ecomonic benefits of the project. Those opposing the project expressed concerns mostly over pollution, impacts to fragile desert environs, and carbon dioxide emissions.

Comments received in response to solicitations, including names and addresses of those who commented, are considered part of the public record on this EIS and are available for public inspection at the BLM Ely District Office.

6.1.4 EIS Mailing List

An EIS mailing list of interested persons was initially assembled from the scoping mailing list with the addition of persons who expressed interest in being added to the mailing list during and subsequent to scoping. The mailing list for the Project was revised to add those persons who provided comments in response to scoping, requested to be on the mailing list, or signed a scoping meeting attendance list. Respondents that provided more than one comment letter are listed only once in the mailing list.

On January 16, 2008, a newsletter was sent out to the 9,128 persons on the current mailing list. The newsletter mailing was multi-purpose, as it provided an update on the project schedule, summarized scoping, presented the Mt. Wheeler Powerline component, and requested information as to who wanted to remain on the mailing list.

6.1.5 Distribution of the Draft EIS

The Draft EIS review period was initiated by publication of the Notice of Availability (NOA) for the Draft EIS in the Federal Register. The Draft EIS was distributed as follows:

- A Notice of Availability was published in the Federal Register specifying dates for the comment period and the date, time, and location of the public comment meetings.
- A news release was provided by the agencies at the beginning of the comment period on the Draft EIS. The news release was submitted to the same news organizations as for the initial public scoping announcement.
- The Draft EIS was distributed to interested parties identified in the updated EIS mailing list, as described above, and also made available via the internet.

6.1.6 Final EIS Distribution

The Final EIS distribution will be completed after consideration is given to comments received on the Draft EIS. A 30-day Final EIS availability period will be initiated by publication of the Notice of Availability for the Final EIS in the Federal Register. The Final EIS will be released as follows:

- Notice of Availability published in the Federal Register.
- Copies of the Final EIS will be sent to addresses on the updated mailing list and made available via the internet.
- A news release will be issued to the same newspapers used for previous Project announcements.

6.1.7 Record of Decision

Subsequent to the 30-day availability period for the Final EIS, the BLM will prepare a Record of Decision. The BLM Record of Decision will be distributed to individuals and organizations identified on the updated Project mailing list. A Notice of Availability will be published in the Federal Register. A news release will be made to the same newspapers used for previous Project announcements.

6.2 Criteria and Methods by Which Public Input will be Evaluated

Letters and oral comments received on the Draft EIS will be reviewed and evaluated. Responses will be prepared for substantive comments and modifications or corrections will be made to the EIS as determined necessary in response to these comments. Copies of these comments, along with responses to them, will be included in the Final EIS.

Consultation with Others

The following federal, state, and local agencies have continued to participate as cooperating agencies:

- U.S. Department of the Interior, National Park Service
- U.S. Environmental Protection Agency
- White Pine County
- The Confederated Bands of the Goshute Tribe (invited)

In addition, the following state and federal agencies were consulted during preparation of the EIS:

- U.S. Department of the Interior, Bureau of Indian Affairs
- U.S. Department of Agriculture, Forest Service

- U.S. Department of Fish and Wildlife Service
- U.S. Air Force
- Nevada Division of State Parks
- Nevada Division of Environmental Protection, Bureau of Water Pollution Control
- Nevada Division of Forestry

As part of Government-to-Government consultation, Native American consultation letters were sent out by the BLM, Ely District Office on July 23, 2007 to the Tribes and tribal organizations listed in **Table 3.11-1**. Consultation with Tribes is on-going. See **Section 4.11** for details regarding Native American Consultation.

6.3 List of Preparers and Reviewers

Lead Agency: Bureau of Land Management (BLM), Ely District Office

Cooperating Agencies:

- Region IX Environmental Protection Agency (EPA)
- U.S. Department of the Interior, National Park Service, Great Basin National Park
- White Pine County
- The Confederated Bands of the Goshute Tribe (invited)

Interdisciplinary Team (IDT) and Technical Specialists: See **Table 6.3-1** below.

TABLE 6.3-1. INTERDISCIPLINARY TEAM (IDT) AND TECHNICAL SPECIALISTS

BLM National Project Manager – Joe Incardine, Utah State Office			
BLM Nevada State Office Project Lead - Jacqueline Gratton			
Resource	**Ely District Office**	**Elko District Office**	**Southern Nevada District Office**
District Office Project Lead	Jane Peterson	Allen Mariluch	Beth Domowicz
Water Resources	Kari Harrison Tom Olsen	Mark Dean	Sara Peterson
Geology/Minerals	Dave Davis	Deb McFarlane	David Fanning
Paleontological Resources	Shawn Gibson	Tim Murphy	Susanne Rowe
Soils	Kari Harrison	Mark Dean	Lisa Christianson
Air Quality	Susan Caplan (NOC) Scott Archer (NOC)	Mark Dean	Lisa Christianson
Vegetation/Noxious and Invasive Weeds	Bonnie Million Mindy Seal Marian Lichtler	Mark Coca	Christina Lund Everett Bartz
Wildlife and Habitat	Marian Lichtler	Nycole Burton Wendy Fuell	Marc Maynard
Special Status Species	Marian Lichtler	Nycole Burton Wendy Fuell	Marc Maynard
Range Resources/ Wild Horses (WH)	Mindy Seal Ben Noyes (WH)	Karl Scheetz Bruce Thompson Jeff Moore Bryan Fuell (WH)	Everett Bartz Jerri Bertola
Cultural Resources	Shawn Gibson	Tim Murphy	Susanne Rowe

BLM National Project Manager – Joe Incardine, Utah State Office			
BLM Nevada State Office Project Lead - Jacqueline Gratton			
Resource	**Ely District Office**	**Elko District Office**	**Southern Nevada District Office**
Native American Concerns	Elvis Wall	Gerald Dixon	Susanne Rowe
Land Use/Access	Doris Metcalf	Allen Mariluch	Beth Domowicz
Special Designations	Dave Jacobson	Steve Dondero	Beth Domowicz
Recreation	Kalem Lenard	Steve Dondero	Robert Wandel
Visual Resources	Sheri Wysong , Kalem Lenard	Steve Dondero	Michael Johnson
Noise	Jane Peterson Sheri Wysong	Joe Incardine	Joe Incardine
Socioeconomics	Karen Rajala	Allen Mariluch	Beth Domowicz
Environmental Justice	Karen Rajala	Allen Mariluch	Beth Domowicz
Hazardous and Solid Waste	Melanie Peterson	Deb McFarlane	Michael Moran
Transportation	Karen Rajala		
Climate Change/ Global Warming	Sheri Wysong Susan Caplan (NOC) Scott Archer (NOC)		

TABLE 6.3-2. THIRD PARTY CONTRACTOR – JBR ENVIRONMENTAL CONSULTANTS, INC

Role / Resource	Staff	Experience
Project Manager Ground Water Hazardous & Solid Waste Public Health & Safety	Brian Buck, PG JBR Salt Lake City	MS Geological Engineering BS Geology 32 Years Experience
Assistant Project Manager Wildlife & Habitat	Greg Brown JBR Salt Lake City	BS Natural Resources 13 Years Experience
Socioeconomics Environmental Justice	Linda Matthews JBR Salt Lake City Jon Schulman JBR Salt Lake City Allan Isaacson (Deceased) University of Utah Salt Lake City Jan Crispin University of Utah Salt Lake City	BS Environmental Studies 22 Years Experience MS Environmental Engineering MA Journalism BA English 13 Years Experience BS Mechanical Engineering MBA 17 Years Experience BA Business Management MBA 22 Years Experience

Role / Resource	Staff	Experience
Cultural Resources Native American Concerns Paleontological Resources Transportation	Jenni Prince Mahoney JBR Salt Lake City	BS Anthropology MC NEPA 14 Years Experience
Visual Resources	Richard Duncan JBR Reno, NV	BA Economics MS Biology 11 Years Experience
Water Resources	Ryan Clerico JBR Salt Lake City Alan Mayo, PhD Alan Mayo Associates Orem, UT EMS-i South Jordan, UT	BS Biology 10 Years Experience MS Geology BS Geology PhD Hydrogeology 28 Years Experience
Vegetation Noxious Weeds & Invasive Species Fire management	Ryan Clerico JBR Salt Lake City	BS Biology 10 Years Experience
Air Quality Noise	Dan Heiser PE JBR Boise, ID Chris Johnson JBR Boise, ID	BS Chemical Engineering MBA 25 Years Experience BS Math & Earth Sciences 29 Years Experience
Geology Minerals	Jim Sage JBR Salt Lake City	BS Geology 9 Years Experience
Special Status Species	John Curl JBR Salt Lake City	BS Public Lands Policy 8 Years Experience
Range Resources Wild Horses Specials Designations	Marit Sawyer JBR Salt Lake City	BS Range Science 10 Years Experience
Soils Prime & Unique Farmland	Karen Kinsella JBR Elko, NV	BS Resource Management, Soils AS Biology/Computer 8 Years Experience
Land Use & Access Recreation	Tom Hale JBR Salt Lake City	MS Park and Recreation Management MLA Environmental Planning BLA Landscape Architecture 17 Years Experience
Cumulative Effects	Schelle Davis JBR Salt Lake City Jon Schulman JBR Salt Lake City	BA Environmental Studies 18 Years Experience MS Environmental Engineering MA Journalism BA English 13 Years Experience

6.4 Mailing Lists

An important part of the NEPA process is to invite public comment (CEQ §1503.1) by actively soliciting comments from those persons, organizations, or agencies who may be interested or affected by the proposed project. BLM is required to submit the EIS to several agencies and the proponent; these consitute the mandatory mailing list (**Table 6.4-1**). Other agencies (federal,

state, local), organizations, and individuals who may be affected by the project, may be stakeholders, or may simply be interested constitute the interested parties mailing list.

6.4.1 Mandatory Mailing List

The following mandatory mailing list was compiled using the BLM NEPA Handbook H-1790-1 mandatory distribution list. The number in parenthesis is the number of hardcopies required.

TABLE 6.4-1. MANDATORY MAILING LIST

ADVISORY COUNCIL ON HISTORIC PRESERVATION (*) DIRECTOR, PLANNING & REVIEW 1100 PENNSYLVANIA AVE, NW, STE. 809 WASHINGTON D.C. 20004	NATIONAL PARK SERVICES (4) ENVIRONMENTAL QUALITY DIVISION 1201 EYE STREET NW WASHINGTON D.C. 20005	US DEPT OF THE INTERIOR (3) GEOLOGICAL SURVEY ENVIRONMENTAL AFFAIRS PROGRAM NATIONAL CENTER (423) RESTON, VA 20192
ARMY CORPS OF ENGINEERS (2) SOUTH PACIFIC DIVISION CHIEF, PLANNING DIVISION 1455 MARKET STREET SAN FRANCISCO, CA 94103	NATIONAL SCIENCE & TECHNOLOGY CENTER (2) P.O. BOX 25047 BUILDING 50, DENVER FEDERAL CENTER DENVER, CO 80225-0047	US DEPT OF THE INTERIOR (3) DIRECTOR, OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE 1849 C STREET, NW 2342-MIB WASHINGTON D.C. 20240
BLM PLANNING OFFICE (2) MAIL STOP 850 LS 1849 C ST. NW WASHINGTON DC, 20240	NEVADA POWER (1) P.O. BOX 98910 LAS VEGAS, NV 89151	US DEPT OF THE INTERIOR (3) NATURAL RESOURCES LIBRARY 1849 C. STREET NW WASHINGTON D.C. 20240
BUREAU OF RECLAMATION (2) DENVER FEDERAL CENTER BLDG. 67 (D-5000) P.O. BOX 25007 DENVER, CO 80225-0007	OFFICE OF DEPUTY A/S OF THE USAF (1) ENVIRONMENT, SAFETY, AND OCCUPATIONAL HEALTH SAF/RQ ROOM 4C916, PENTAGON WASHINGTON D.C. 20330-0001	US DEPT OF THE INTERIOR (1) OFFICE OF EXTERNAL AND INTERGOVERNMENTAL AFFAIRS 1849 C STREET NW WASHINGTON D.C. 20240
ENVIRONMENTAL PROTECTION AGENCY (5) OFFICE OF FEDERAL ACTIVITIES, EIS FILING STATION AIREL RIOS BLDG (S OVAL LOBBY) RM 7220 1200 PENNSYLVANIA AVE. NW WASHINGTON D.C. 20004	SIERRA PACIFIC POWER (1) P.O. BOX 10100 RENO, NV 89520-0024	US DEPT OF THE INTERIOR FISH & WILDLIFE SERVICE (3) ASSISTANT DIRECTOR, ENDANGERED SPECIES 1849 C ST. NW WASHINGTON D.C. 20240
ENVIRONMENTAL PROTECTION AGENCY (2) REGION 9 75 HAWTHORNE STREET SAN FRANCISCO, CA 94105	US DEPT OF ENERGY (2) OFFICE OF NEPA 1000 INDEPENDENCE AVE. SW MAIL CODE EH-42, ROOM 3E094 WASHINGTON D.C. 20585	
HQ-USAF/LEEV (2) ENVIRONMENTAL DIVISION BOLLING AFB, BLDG. 516 WASHINGTON D.C. 20330-5000	US DEPT OF THE INTERIOR (3) MINERALS MANAGEMENT SERVICE CHIEF, ENVIRONMENT OPS AND ANALYSIS BRANCH 381 ELDON STREET HERNDON, VA 20170-4817	(*) – no hardcopy needed, will access from the web

6.4.2 Interested Parties Mailing List

The Interested Parties mailing list includes persons, organizations, and agencies that were included in the initial scoping mailing list, those who attended scoping meetings, those that commented during the scoping process, respondants to the January 2008 newsletter, and those who in some other way expressed interest in the project. This mailing list currently includes 9,128 interested parties. **Table 6.4-2** includes the federal agencies, state agencies, local

agencies, government officials, tribal governments, and other organizations. The entire list of interested parties is part of the project record and available upon request. This list will continue to be updated throughout the NEPA process.

TABLE 6.4-2. AGENCIES AND ORGANIZATIONS ON CURRENT MAILING LIST

FEDERAL AGENCIES	STATE AGENCIES
Army Corps of Engineers, Reno Regulatory Office	Nevada Department of Wildlife, Ely, Elko, & Reno, NV
BLM Oil and Gas Inspector	NDEP Bureau of Water Pollution Control, Carson City, NV
Department of USAF Commander	Nevada Division of Environ. Protection, Carson City, NV
Great Basin National Park, Baker, NV	Nevada Division of Forestry, Las Vegas, NV
Humboldt-Toiyabe National Forest, Ely, NV	Nevada Division of State Parks, Baker, NV
National Park Service, Boulder, NV	Nevada Division of State Parks, Carson City, NV
US Department of the Interior	Nevada State Clearinghouse, Carson City, NV
USDI Bureau of Indian Affairs, St. George, UT	Nevada State Historic Preservation Office, Reno, NV
USDI Bureau of Indian Affairs, Elko, NV	Nevada State Legislature, Elko, NV
USDI Park Services	
US EPA Region IX	
US Forest Service, McGill, NV	
US Fish and Wildlife, Reno, NV	
US Fish and Wildlife, Las Vegas, NV	
LOCAL AGENCIES	**GOVERNMENT OFFICIALS**
Bear River Watershed Council, Richmond, UT	City of Ely Mayor, George Chachas
Elko County Board of Commissioners, Elko, NV	
Lincoln County Commissioners, Pioche, NV	
Southern Nevada Water Authority, Las Vegas, NV	
White Pine County Board of Commissioners, Ely, NV	
TRIBAL GOVERNMENTS	**OTHER ORGANIZATIONS**
Colorado River Indian Tribes, AZ	Basin Research Associates
Kaibab Paiute Tribe, AZ	California Native Plant Society
Timbisha Shoshone Tribe, CA	Citizen Alert, Las Vegas
Duck Valley Shoshone-Paiute Tribes, NV	Center for Biological Diversity, San Francisco, CA
Duckwater Shoshone Tribe, NV	Duck Creek Basin Homeowners, McGill, NV
Ely Shoshone Tribe, NV	Ducks Unlimited, Rancho Cordova, CA
Las Vegas Paiute Tribe, NV	Friends of the Schell Creek Range, McGill, NV
Moapa Band of Paiutes, NV	Grand Canyon Trust, Flagstaff, AZ
Pahrump Paiute Tribe, NV	Great Basin Chapter, Trout Unlimited, Baker, NV
Shudahai / Western Shoshone, NV	Nature Conservancy, Reno, NV
Te-Moak Tribe of Western Shoshone, NV	Nevada Conservation League, Las Vegas, NV
Battle Mountain Band	Nevada Grn Property, Reno, NV
Elko Band	Post Carb Salt Lake, Salt Lake City, UT
South Fork Band	Progress Leadership Alliance of Nevada, Reno, NV
Wells Band	Resource Concepts, Inc.
Yomba Shoshone Tribe, NV	Sevier Citizens for Clean Air and Water, Richfield, UT
Confederated Tribes of the Goshute Reservation, UT	Sierra Club Environmental Law Program, SF, CA
Paiute Indian Tribe of Utah, UT	Sierra Club, Reno, NV
Cedar Band	Sierra Club, Utah Chapter, Salt Lake City, UT
Indian Peaks Band	Wasatch Clean Air Coalition, SLC, UT
Kanosh Band	Western Lands Project, Seattle, WA
Western Shoshone Defense Council, NV	Western Research Advocates, Carson City, NV
	Western Watershed Project, Boise, ID

Chapter 7
References, Index, Acronyms, Units of Measure, Glossary, and Explanation of Impacts

Chapter 7
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Chapter 7
References, Index, Acronyms, Units of Measure, Glossary, and Explanation of Impacts

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7.2 Index

7.3 Acronyms

AADT	Average Annual Daily Traffic
AAQS	Ambient Air Quality Standards
ACEC	Areas of Critical Environmental Concern
ac-ft	acre-feet
ADA	Americans with Disabilities Act
AFY	acre feet per year
AML	Appropriate Management Level
APE	Area of Potential Effect
AQRV	Air Quality Related Value
ARPA	Archaeological Resources Protection Act
ASTM	American Standards for Testing and Materials
AUM	Animal Unit Month
AZ/NM/SNV	Arizona New Mexico Southern Nevada Power Area
BCT	Bonneville Cutthroat Trout
bgs	Below ground surface
BLM	Bureau of Land Management
BMP	Best Management Practice
BTU	British thermal unit
CA/MX	California Mexico Power Area
CAA	Clean Air Act
CDP	Census designated place
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COM	Construction, Operation, and Maintenance
Corps	United States Army Corps of Engineers
CR	County Road
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel
DNL	day-night sound level
DNWR	Desert National Wildlife Refuge
DOI	Department of the Interior
EEC	Ely Energy Center
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ET	Evapotranspiration
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FEMA	Federal Emergency Management Area
FERC	Federal Energy Regulatory Commission

FGD	Flue Gas Desulfurization
FHWA	Federal Highways Administration
FIRM	Flood Insurance Rate Maps
FLAG	Federal Land Managers Air Quality Related Values Workgroup
FLEFA	Federal Land Exchange Facilitation Act
FLM	Federal Land Manager
FLPMA	Federal Land Policy and Management Act
g	force of gravity
GBNP	Great Basin National Park
GLO	General Land Office
gpm	gallon per minute
GPS	Global Positioning System
HALS	Historic American Landscape Survey
HDPE	High density polyethylene
HMA	Horse Management Area
hr	Hour
IGCC	Integrated Gasification Combined Cycle
IMPROVE	Integrated Monitoring of Protected Visual Environments
IRP	Integrated Resource Plan
KCC	Kennecott Copper Company
km	Kilometer
KOP	Key Observation Point
kV	Kilovolt
kW	Kilowatt
kWh	kilowatt hour
lb	Pound
LDS	The Church of Jesus Christ of Latter Day Saints
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_{min}	minimum sound level
LNG	Liquefied Natural Gas
LOS	Level of Service
MBTU	million British thermal unit
mgd	million gallons per day
MW	Mega Watt
n/a	not applicable
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAICS	North American Industrial Classification System
NAIP	National Agriculture Imagery Program
NBAPC	Nevada Bureau of Air Pollution Control
NCA	Noise Control Act
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NI	No Indicator

NNHP	Nevada Natural Heritage Program
NNRy	Nevada Northern Railway
NO_x	Nitrogen Oxide
NPC	Nevada Power Company
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NVCRIS	Nevada Cultural Resources Information System
NWI	National Wetlands Inventory
NWPP	Northwest Power Pool area
NWR	National Wildlife Refuge
NWS	National Weather Service
OBL	Obligate
OGW	Other Ground Water
OHV	Off-highway Vehicle
OHWM	ordinary high water mark
OPTC	Operating Permit to Construct
OSHA	Occupational Safety and Health Act
OSW	Other Surface Water
PA	Programmatic Agreement
PC	Pulverized Coal
PET	Pony Express Trail
PM_{10}	Particulate matter with diameter less than 10 microns
PPA	Pollution Prevention Act
PSD	Prevention of Significant Deterioration
PUCN	Public Utilities Commission of Nevada
PZ	Precipitation Zone
rd.	Road
RGL	Regulatory Guidance Letter
RMPA	Rocky Mountain Power Area
RMP	Resource Management Plan
RNA	Research Natural Area
ROW	Right-of-way
RV	Recreational Vehicle
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCR	Selective Catalytic Reduction
SDA	Special Designation Area
SDWA	Safe Drinking Water Act
SEO	State Engineers Office
SIL	Significant Impact Limits
SLERA	Screening Level Ecological Risk Assessment
SNPLMA	Southern Nevada Public Land Management Act
SNWA	Southern Nevada Water Authority
SO_2	Sulfur Dioxide
SODAR	Sonic detection and ranging
SPPC	Sierra Pacific Power Company
SR	State Route
SRMA	Special Recreation Management Area
SRP	Special Recreation Permit
SWIP	Southwestern Intertie Project
TCP	Traditional Cultural Property

TE&S	Threatened, Endangered, and Sensitive
TEPC	Threatened, Endangered, Proposed, and Candidate
TV	Television
Ug/m^3	micrograms per cubic meter
UNLV	University of Nevada Las Vegas
UPL	Obligate Upland
UPRR	Union Pacific Railroad
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Service
UV	Ultraviolet
VHF	Very high frequency
VOC	Volatile Organic Compound
VRM	Visual Resource Management
WA	Wilderness Area
WECC	Western Electricity Coordinating Council
WMA	Wildlife Management Area
WPES	White Pine Energy Station
WSA	Wilderness Study Area
yr	Year

7.4 Units of Measure

C	Celsius
Cfs	cubic feet per second
dB	decibel
dBA	A-weighted decibel sound scale
dw	dry wieght
F	Fahrenheit
ft	feet
g	grams
gal	gallon
gpm	gallons per minute
ha	hectares
in	inch
kV	kilovolt
kW	kilowatt
lb	pound
m	meters
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mi	miles
mm	millimeters
MM	million
mph	miles per hour
ppm	parts per million
%	percent
µg/m^3	micrograms per cubic meter

7.5 Glossary

Acre-feet. The volume required to cover 1 acre to a depth of 1 foot, which is equivalent to 43,560 cubic feet.

Action. In the context of the national Environmental Policy Act (NEPA), describes actions proposed to meet a specific purpose and need that may have effects on t he environment, which are potentially subject to Federal control and responsibility. Federal actions generally fall into the categories of adoption of official policy, formal plans, and programs; or approval of specific projects. For this document, the term action applies to a specific project.

Air Quality. A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

Alluvial. Pertaining to material or processes associated with transportation or deposition of soil and rock by flowing water (e.g., streams and rivers).

Alluvium. Soil and rock deposited by flowing water (e.g., streams and rivers); consists of unconsolidated deposits of sediment, such as silt, sand, and gravel.

Alternative. Any one of a number of options for a project.

Ambient. Surrounding, existing, background conditions.

American Indian tribe (or tribe). Any American Indian group in the conterminous United States that the Secretary of the Interior recognizes as possessing tribal status (listed periodically in the Federal Register).

Animal unit month (AUM). The amount of forage necessary to sustain one cow and one calf (e.g., a 1,000-pound cow and calf) for a period of one month.

Annual (ecology). A plant that completes its development in one year or one season and then dies.

Anthropogenic (climate change/global warming). Resulting from or produced by human beings.

Aquatic. Growing or living in or near the water.

Aquifer. A water-bearing rock unit (unconsolidated or bedrock) that will yield water in a usable quantity to a well or spring.

Archaeological site. A discrete location that provides physical evidence of past human use.

Archaeology. The scientific study of the life and culture of past, especially ancient, peoples, as by excavation of ancient cities, relics, artifacts, etc.

Area of Critical Environmental Concern (ACEC). A Bureau of land management (BLM) designation pertraining to areas where specific management attention is needed to protect and prevent irreparable damage to important historical, cultural, and scenic values, fish or wildlife resources, or other anatural systems or processes, or to protect human life and safety fro natural hazards.

Arroyo. A dry gully, or a stream in a dry region.

Artifact. Any object showing human workmanship or modification, especially from a prehistoric or historic culture.

Ash. The residue that remains when something is burned. Also, one component of coal; generally, high ash-content coal is considered to be low-grade.

Assessment. The act of evaluating and interpreting data and information for a defined purpose.

Backfill. The material (soil and/or rock) that fills a void. The material used to fill a trench in the groundbed (i.e., pipeline trench). The composition of the backfill varies based on the soil type being used and the component being covered.

Background (visual). That portion of the visual landscape lying from the outer limit of the middleground to infinity. Color and texture are subdued in this area, and visual sensitivity analysis here is primarily concerned with the two-dimensional shape of landforms against the sky.

Baghouse. An air pollution control device containing a large fabric bag, usually made of glass fibers, used to eliminate intermediate and large (greater than 20 PM [particulate matter] in diameter) particles. This device operates like the bag of an electric vacuum cleaner, passing the air and smaller paricles while entrapping the larger ones.

Basic Elements (visual). The four major elements (form, line, color, and texture) that determine how the character of a landscape is perceived.

Baseline. The existing conditions against which impacts of the proposed action and its alternatives can be compared.

Basin. A depressed area having no surface outlet (topographic basin); a physiographic feature or subsurface structure that is capable of collecting, storing, or discharging water by eason of its shape and the characteristics of its confining material (water); a depression in the earth's surface, the lowerst part often filled by a lake or pond (lake basin); a part of a river or canal widened (drainage, river, stream basin).

Best Management Practices (BMPs). Vegetative and structural methods to control erosion and sedimentation.

Big Game. Large species of wildlife that are hunted (such as elk, deer, pronghorn antelope).

Biological Assessment. Information prepared by or under the direction of the federal agency concerning listed species that may be present in the action area and the evaluation of potential effects of the action on such species and habitats. The purpose of the biological assessment is to evaluate the potential effects of the action on listed or proposed species or designated or

proposed critical habitat, and determine whether any such species and habitats are likely to be adversely affected by the action. Biological Assessments are conducted for major federal construction projects requiring an EIS.

Biological Opinion. A document that is the product of formal consultation, stating the opinion of the U.S. Fish and Wildlife Service on whether or not a Federal action is likely to jeopardize the continued existence of Endangered Species Act-listed species or result in the destruction or adverse modification of critical habitat.

Boiler. Any device used to burn coal fuel to heat water for generating steam.

Butte. A steep hill standing alone in a plain.

Candidate Species. A plant or animal species not yet officially listed as threatened or endangered under the Endangered Species Act, but which is undergoing status review by the U.S. Fish and Wildlife Service.

Chert. A hard, dense microcrystalline or cryptocrystalline sedimentary rock, consisting chiefly of interlocking crystals of quartz less than about 30 Φm in diameter; it may contain amorphous silica (opal). It has conchoidal fracture, and may be white or variously colored. Chert occurs principally as nodular or concretionary segregations, or nodules in limestone and dolomite, and less commonly as layered deposits, or beded chert; it may be an organic or inorganic precipitate or a replacement product.

Chronic. Marked by long duration or frequent recurrence.

Clean Air Act of 1990. Federal legislation governing air pollution. The Clean Air Act established National Ambient Air Quality Standards for carbon monoxide,nitrogen oxide, ozone, particulate matter, sulfur dioxide, and lead. Prevent of Significant Deterioration classifications define the allowable increased levels of air quality deterioration above legally established levels and include the following:

Class I – minial additional deterioration in air quality (certain national parks and wilderness areas)

Class II – moderate additional deterioration in air quality (most lands)

Class III – greater deterioration for planned maximum growth (industrial areas)

Clean Water Act of 1987. National environmental law enforced by the U.S. Environmental Protection Agency that regulates water pollution.

Coal. A fossil fuel extracted from the ground by deep mining. It is a readily combustible black or brownish-black sedimentary rock composed primarily of carbon and hyudrocarbons along with othe elements including sulfur. Coal is formed from plant remains that have been compacted, hardened, chemically altered, and metamorphosed by heat and pressure over geologic time. It is primarily used as a solid fuel to produce heat through combustion and is the most common source of energy for electricity generation worldwide.

Contrast (visual). The effect of a striking difference in form, line, color, or texture of the landscape features within the area being viewed.

Cooperating agency. Assists the lead Federal agency in developing an environmental assessment or environmental impact statement. The Council on Environmental Quality regulations impelementing NEPA define a cooperating agency as any agency that has jurisdiction by law or special expertise for proposals covered by NEPA (40 CFR 1501.6). Any Federal, state, or local government jurisdiction with such qualification may become a cooperating agency by agreement with the lead agency.

Council on Environmental Quality (CEQ). An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effort on environmental studies and advises the President on environmental matters.

Criteria. Standards on which a judgment or decision can be based.

Cubic feet per second (CFS). Unit of discharge, or volume rate of flow, equal to 0.0283 cubic meters per second. As a rate of streamflow, a cubic foot of water passing a referenced section in one second. A measure of a moving volume of water.

Cultural resources. Remains of human activity, occupation, or endeavor as reflected in districts, sites, buildings, objects, artifacts, ruins, works of art, architecture, and natural features important in human events.

Cumulative effect (or impact). The impact on the environment that results from the incremental impact of the action when added to other past, present,a nd reasonably foreseeable actions. Cumulative impacts are evaluated as part of the environmental impact statement (EIS), and may include consideration of additive or interactive effects regardless of what agency or person undertakes the other actions.

dBA. The sound pressure levels in decibels measured with a frequency weighing network corresponding to the A-scale on a standard sound level meter. The A-scale tends to suppress lower frequencies (e.g., below 1,000 Hz).

Decant. To remove or pour off a liquid without disturbing associated sediment or solids.

Decibel (dB). One-tenth of a Bel is a measure on a logarithmic scale that indicates the ratio between two sound powers. A ratio of 2 in power corresponds to a difference of 3 decibels between two sounds. The decibel is the basic unit of sound measure.

Direct effect. See effect.

Discharge. Outflow of surface water in a stream or canal (water). Discharge from an industrial facility that may contain pollutants harful to fish or animals if it is released into nearby water bodies usually requires a permit issued by the U.S. environmental Protection Agency and is monitored.

Diversion. A channel, embankment or other manmade structure constructed to divert water from one area to another; the process of using these structures to move water.

Drainage. The natural or artificial removal of surface water and groundwater from a given area. Many agricultural soils need drainage to improve production or to manage water supplies.

Drawdown. The decrease in elevation of the water surface in a well, the local water table or the pressure head on an artesian well due to extraction of groundwater or decrease in recharge to the aquifer.

Easement. A right afforded to a person, agency, or organization to make limited use of another's real property for access or other pruposes.

Ecology. The relationship between living organisms and their environment.

Effect (impact). A modification of the existing environment as it presently exists, caused by an action (such as construction or operation of facilities). An effect may be direct, indirect, or cumulative. The terms effect and impact are synonymous under the NEPA. A direct effect is caused by an action and occurs at the same time and same place (40 CFR 1508.8(a)). An indirect effect is caused by the action later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water other natural systems including ecosystems.

Emergent. Vegetation with all or part of their vegetative and reproductive parts above the water.

Emission. Effluent discharged into the atmosphere, usually specified by mass per unit time, and considered when analyzing air quality.

Endangered Species. Species in danger of extinction throughout all or a significant portion of its range. Endangered species are rarely identified by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.

Endangered Species Act (ESA) of 1973. Provides a means whereby the ecosystems upon which threatened and endangered species depend may be conserved and to provide a program for the conservation of such threatened and endangered species. The ESA requires all Federal agencies to seek to conserve threatened and endangered speices, ue applicable authorities in furtherance of the purposes of the ESA, and avoide jeopardizing the continued existence of any species that is listed or proposed for listing as threatened and endangered or destroying or adversely modifying its designated or proposed critical habitat. The U.S. Fish and Wildlife Service is responsible for administration of this act.

Endemic. Plants or animals that are native to a particular region or country.

Environmental impact statement (EIS). A document prepared to analyze the impacts on the environment of a proposed action and released to the public for review and comment. An EIS must meet the requirements of NEPA, CEQ, and the directives of the agency responsible for the proposed action.

Environmental justice. The fair treatment and meaningful involvement of all people regardless of race, color national origin, or income with respect to the development, impelmentatin, and enforcement of environmental laws, regulations and policies. Fiar treatment means that no group of people including gracial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and ecommercial operations or the execution of Federal, state, local, and tribal programs and policies. (see Executive Order 12898).

Ephemeral stream (wash, creek, waterbody). A stream or portion of a stream which flows briefly in direct response to precipitation in the immediate vicinity, and whose channel is at all times above the water table.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geological agents and by such processes as "gravitation creep."

Evapotranspiration (ET). The portion of precipitation returned to the air through evaporation and transpiration by plants.

Fate and Transport. Description of the movement of a contaminant through a groundwater system which may include the effects of dilution, dispersion, attenuation and various chemical reactions.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579 signed by the President on October 21, 1976. Established public land policy for management lands administered by the Bureau of Land Management (BLM). FLPMA specifies several key directions for the BLM, notably: (1) management on the basis of multiple use and sustained yield; (2) land use plans prepared to guide management actions; (3) public lands for the protection, development, and enhancement of resources; (4) public lands retained in federal ownership; and (5) public participation used in reaching management decisions.

Federal Register. Published by the Office of the Federal Register, National Archivees and Records Administration, the *Federal Register* is the official daily publication for rules, proposed rules, and notices of Federal agencies and organizations, as well as executive orders and other presidential documents.

Floodplain. The low and relatively flat areas adjacent to rivers and streams. A 100-year floodplain is that area subject to a 1 percent or greater chance of flooding in any given year.

Folds. A bend in planar features in rocks - like an extended wrinkle. A fold is usually the product of geologic deformation.

Forage. Vegetation used for food by wildlife, particularly big game wildlife and domestic livestock.

Foreground. The visible area from a viewpoint or use area out to a distance of 0.5 mile. The ability to perceive detail in a landscape is greatest in this zone.

Forbs. Any herbaceous plant other than a grass.

Fossil. Any remains, trace, or imprint of a plant or animal that has been preserved by natural process in the earth's crust since some past geologic time.

Game Species. Animals commonly hunted for food or sport.

Geographic Information System (GIS). A system of computer hardware, software, data, people and applications that capture, store, edit, analyze, and graphically display a potentially wide array of geospatial information.

Geology. The science that relates to the earth, the rocks of which it is composed, and the changes that the earth has undergone or isundergoing.

Geothermal resource. Heath found in rocks and fluids at various depths within the earth's crust that can be extracted by drilling or pumping for use as an energy source. This heat may be residualheat, friction heat, or a result of radioactive decay.

Global warming. An increase in the average temperature of the earth's atmosphere and oceans. The term is also used to describe the theory that increasing temperatures are the result of a strengthening greenhouse effect caused primarily by manmade increases in carbon dioxide and other greenhouse gases.

Greenhouse effect and greenhouse gases. The warming of the Earth and it's atmosphere through the trapping of heat from the Sun by gases, known as greenhouse gases, in the earth's atmosphere.

Groundwater. Subsurface water that fills available openings in rock or soil materials to the extent that they are considered water saturated.

Habitat. A specific set of physical conditions in a geographic area(s) that surrounds a single species, group of species, or large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

Headwaters. The source of a stream or river.

Hydrology. The study of the movement, distribution, and quality of water throughout the earth, addresses both the hydrologic cycle and water resources.

Hydraulic communication. Connection between two different water sources, such as a surface water source and a ground water source.

Hydraulic Conductivity (K). A coefficient of proportionality describing the rate at which water can move through a permeable medium.

Hydric Soils. Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation.

Hydrographic basin (area, region, unit). A geographic area drained by a single major stream or an area consisting of a drainage system comprised of streams and often natural or man-made lakes. See also basin.

Hydrophytic Vegetation. The total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.

Impact. See effect.

Impoundment. A closed basin, naturally formed or artificially built, which is dammed or excavated for the retention of water, sediment, or waste.

Indirect effect. See effect.

Infrastructure. The facilities, services, and equipment needed for a community or facility to function, such as and including roads, sewers, water lines, and electric lines.

Intermittent. A river or stream that flows for a period of time, usually seasonally during rainy periods, and stops during dry periods. In arid regions, dry periods may be interrupted by occasional flash floods from brief but intense rain storms.

Invasive Species. Describes a large number of nonnative plant species whos introduction causes or is likely to cause economic or environmental harm or harm to human health.

Key Observation Point (KOP). An observer position on a travel route used to determine visible area.

Kilovolt (kV). A unit of power equivalent to 1,000 volts (A volt is a measure of electrical potential difference that would cause a current of 1 ampere to flow through a conductor whose resistance is 1 ohm.

Kilowatt (kW). A unit of power equivalent to 1,000 watts.

Labor Force. All persons 16 years of age or over who are either employed or unemployed and actively looking for a job.

Landform. A term used to describe the many land surfaces that exist as a resultof geologic ctivity and weathering (e.g., plateaus, mountains, plains, and valleys).

Land Use Plan. The organized direction or management of the use of lands and their resources to best meet human needs over time, according to the land's capabilities.

Lease. An authorization or contract by which one party (lessor) conveys the use of property to another (lessee) in return for rental payments. In cases of resource production, lessees pay royalties to the lessor in addition to rental payments.

Lithic. Pertaining to stone or a stone tool (for example, lithic artifact).

Megawatt (MW). A unit for measuring power equal to one million watts. The productive capacity of electrical generators is measured in megawatts.

Mesa. An isolated, nearly level land mass, formed on nearly horizontal rocks, standing aboe the surrounding country and bounded with steep sides.

Mesic. Moist habitats associated with springs, seeps, and riparian areas.

Minimal (impact). Unless otherwise specified "minimal" shall mean non-deleterious impacts that are measureable in the short term, but not significant.

Mitigation. Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

National Ambient Air Quality Standards (NAAQS). The allowable concentrations of air pollutants in the air specified by the Federal government and established by the Clean Air Act.

The air quality standards are divided into primary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public health) and secondary standards (based on the air quality criteria and allowing an adequate margin of safety and requisite to protect the public welfare) from any unknown or expected adverse effects of air pollutants.

National Environmental Policy Act (NEPA) of 1969. Our nation's basic charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. In accordance with NEPA, all Federal agencies must prepare a written statement on the environmetnalimpacts of a proposed action. The provisions to ensure that Federal agencies act according to the letter and spirit of NEPA are the CEQ regulations for implementing NEPA 943 CFR 1500-1508).

National Register of Historic Places. A listing, maintained by the Secretary of the Interior, of districts, sites, buildings, structures, and objects worthy of preservation. To be eligible a property must normally be at least 50 years old, unless it has exceptional significance, and have national, State, or local significance in American history, architecture, archaeology, engineering, or culture; and possess integrity of location, design, setting, material, workmanship, feeling, and association; and (a) be associated with events that have made a significant contribution to the broad pattern of history, (b) be associated with the lives of persons significant to our past, or (c) embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant and distinguishable entity whose components may lack individual distinction; or (d) have yielded, or may be likely to yield, information important to prehistory or history.

Negligible (impact). Unless otherwise specified, "negligible" shall mean impacts of such a small scale such as to be non-measureable.

Nonattainment area. An air quality control region (or portion thereof) in which the U.S. Environmental Protection Agency has determined that ambient air concentrations exceed national ambient air quality standars for one or mor criteria pollutants.

Noxious Weed. Nonnative plant species that negatively impact crops, native plant communities, and/or management of natural or agricultural systems. Noxious weeds are officialy designated by a number of states (including Nevada and Utah) and Federal agencies.

Peak Flow. The greatest flow attained during melting of winter snowpack or during a large precipitation event.

Perennial (ecology). A plant whose root remains alive more than two years.

Perennial Stream. A stream that flows throughout the year and from source to mouth.

Permeability. The capacity of porous rock, sediment, or soil to transmit a fluid.

pH. The negative $\log_{10}$ of the hydrogen ion activity in solution; measure of acidity or alkalinity of a solution.

$PM_{2.5}$. Particulate matter less than 2.5 microns in aerodynamic diameter.

PM_{10}. Particulate matter less than 10 microns in aerodynamic diameter.

Prime farmland. A special category of highly productive cropland that is recognized and described by thee U.S. Department of Agriculture's Soil Conservation Service and receives special protection under the Surface Mining Law of 1977.

Public land. Land or interest in land owned by the United States and administered through the Secretary of the Interior through the BLM without regard to how the United States acquired ownership, except lands on the Outer Continental Shelf, and land held in trust for the benefit of American Indians, Aleuts, and Eskimos.

Range. A large, open area of land over which livestock can wander and graze.

Raptor. A bird of prey (e.g., eagles, hawks, falcons, and owls).

Recharge. Replenishment of a groundwater reservoir (aquifer) by the addition of water, through either natural or artificial means.

Reclamation. Restoration of land disturbed by natural or human activity (e.g., mining, pipeline construction) to original controu, use, or condition. Also describes the return of land to alternative uses that may, under certain circumstance, be different from those prior to disturbance.

Recontouring. Return a land surface to or near to its original form through some type of action such as grading.

Record of decision. A document separate from, but associated with an EIS that publicly and officially discloses the responsible official's decision on a proposed action.

Reservation. Land set aside to achieve a particular land use or conservation objective. For the purposes of this document, reservation refers to those lands managed by an American Indian tribe under the U.S. Department of the Interior's Bureau of Indian Affiars. The reservation land is Federal territory held 9in trust for tribes. TheAmerican Indian tribes have limited national sovereignty.

Revegetation. The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as reseeding.

Right-of-way. Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, such as a road or utility.

Riparian. Situated on or pertaining to the bank of a river, stream, or other body of water. Riparian is normally used to refer to plants of all types that grow along streams, rivers, or at spring and seep sites.

RMP. Resource Management Plan. Document that establishes direction for the use of resources to best meet the needs of humans over time, according to the resource potential or capability.

Scoping. Procedures by which agencies determine the extent of analysis necessary for a proposed action, (i.e., the range of actions, alternatives, and impacts to be addressed; identification of significant issues related to a proposed action; and the depth of environmental analysis, data, and task assignments needed).

Sediment. Solid fragmental material, either mineral or organic, that is transported or deposited by air, water, gravity, or ice.

Sedimentation. The result when soil or mineral is transported by moving water, wind, gravity or glaciers and depositied in streams or other bodies of water, or on land. Also, letting solids settle out of wastewater by gravity during treatment.

Sediment Load. The amount of sediment (sand, silt, and fine particles) carried by a stream or river.

Sensitive Receptor. In terms of noise, people or animals that might hear a noise or be sensitive to increased noise levels within their range of hearing.

Sensitive Species. Those plant or animal species that are susceptible or vulnerable to activity impacts or habitat alterations.

Shale. A fine-grained detrital sedimentary rock, formed by the compaction of clay, silt, or mud. It has a finely laminated structure, which gives it a fissility along which the rock splits readily, especially on weathered surfaces. Shale is well indurated, but not as hard as argillite or slate. It may be red, brown, black, or gray.

Significant (impact). As used in NEPA, requires consideration of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole, and the affected region, interests, and locality. Intensity refers to the severity of impacts (40 CFR 1508.27).

Slurry. Slurry is a mixture of 50 percent water and 50 percent finely ground coal.

Special status species. Wildlife and plant species either federally listed or proposed for listing as endangered or threatened; state-listed; or priority species of concern to Federal agencies or tribes.

Standard operating procedures (SOPs). A set of written instructions to achieve uniformity of the performance of a specific function.

Storage Coefficient (S). Volume of water that an aquifer absorbs or releases from storage per unit surface area of aquifer per unit decline in the component of hydraulic head normal to the surface; S is dimensionless.

Substation. A facility where electrical voltage is either increased or decreased through the use of transformers.

Switchyard. Transfers the electricity generated by a power plant to the electric transmission system.

Take. A prohibited action under federal law, except where authorized. To harass, harm, pursue, hunt, wound, kill, tranp, capture, or collect a federally listed threatened or endangered species, or to attempt to do so. Take may include disturbance of the listed species, nest, or habitat, when disturbance is extensive enough to disrupt normal behavior patterns for the species, although the affected individuals may not actually die.

Traditional cultural places. These named places (landscape features) comprise the cultural landscape that provides the context for evaluating specific traditional cultural properties.

Transition Zone. The area between two discrete environmental areas, and thus containing elements of each. For example, the transition zone between an upland pinon forest and a lowland desert scrub environment.

Threatened Species. Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Transmissivity (T). The rate at which water will flow through a vertical strip of aquifer of one unit width and extending through the full saturated thickness, under a hydraulic gradient of 1.0.

Tribe. See American Indian tribe.

Ultra-super critical. References the physics of generating steam at higher pressure and temperature; beyond these points, steam is no longer a mixture of steam and water requiring separation in a traditional drum design, and is physically a single fluid that passes through a boiler to drive a steam turbine generator. This new technology reduces fuel consumption and emissions by 5 to 10 percent over conventional "sub-critical" technologies, providing previously unrealized efficiency and operating cost benefits.

Undertaking. A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federa permit, license, or approval; and those subject to State or local regulation administered pursuant to a delegation or approval of a Federal agency.

Ungulate. A hoofed mammal.

Vegetation communities. Species of plants that commonly live together in the same region or ecotone.

View shed. Visible portion of the specific landscape seen from a specific viewpoint, normally limited by landform, vegetation, distance, and existing cultural modifications.

Visibility. The distance to which an observer can distinguish objects from their background. The determinants of visibility include the characteristics of the target object (shape, size, color, pattern), the angle and intensityof sunlight, the observer's eyesight, and any screening present between the viewer and the object (i.e., vegetation, landform, even pollution such as regional haze).

Visual rsource management classes. Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes, each of which has an objective that prescribes the amount of change allowed in the characteristic landscape.

Visual Quality Objective (VQO). A desired level of excellence based on physical and sociological characteristics of an area. Refers to degree of acceptable alteration of the characteristic landscape.

Waters of the United States. All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce including adjacent wetlands and tributaries to water of the United States; and all waters by which the use, degradation, or distruction of which would affect or could affect interstate or foreign commerce.

Watershed. Drainage basin for which surface water flows to a single point.

Well field. Area containing one or more wells that produce, in the case of this document, usable amounts of water.

Wetlands. Areas inundated by surface water or groundwater with a frequency sufficient to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Wetland Values. Based on societal properties by which wetlands are determined to be useful, or impart public good.

Wilderness. An area formally designated by Congress as part of the National Wilderness Preservation System.

Wilderness Study Area. A roadless area of 5,000 acres or more or a roadless island that has been inventoried and found to possess wilderness characteristics as described in Section 2(c) of the Wilderness Act of 1964.

7.6 Explanation of Impacts

Negligible – A change in current conditions that is too small to be physically measured using normal methods or perceptible to a trained human observer. There is no noticeable effect on the natural or baseline setting. There are no required changes in management or utilization of the resource.

Minor – A change in current conditions that is just measurable with normal methods or barely perceptible to a trained human observer. The change may affect individuals of a population or a small (<10 percent) portion of a resource but does not result in a modification in the overall population, or the value or productivity of the resource. There are no required changes in management or utilization of the resource.

Moderate – An easily measurable change in current conditions that is readily noticeable to a trained human observer. The change affects 25 to 75 percent of individuals of a population or similar portion of a resource which may lead to modification or loss in viability in the overall population, or the value or productivity of the resource. There are some required changes in management or utilization of the resource.

Major – A large measurable change in current conditions that is easily recognized by all human observers. The change affects more than 75 percent of individuals of a population or similar portion of a resource which leads to significant modification in the overall population, or the value or productivity of the resource. There are profound or complete changes in management or utilization of the resource. An impact that is not in compliance with applicable regulatory standards or thresholds.

Appendix 2A
Best Management Practices

Appendix 2A
BLM's Best Management Practices

This appendix describes a number of Best Management Practices (BMPs) intended to reduce the potential for short- and long-term impacts to identified resources. These BMPs would be implemented during construction and operation of the Ely Energy Center (EEC) and would be incorporated into all construction specifications and contract documents, as appropriate. All construction and plant personnel would be required to follow them. These BMPs are considered by BLM to be added to the Proposed Action and alternatives evaluated in the EEC EIS for the purposes of environmental impact analysis in the EIS.

Air Quality

1. Personnel would comply with all applicable federal, state, and local laws and regulations concerning prevention and control of air pollution during facility construction and operation.

2. Personnel would obtain necessary air quality permits before starting construction or operating equipment that would result in regulated atmospheric emissions.

3. Personnel would be required to implement measures to minimize dust emissions from construction operations. To accomplish this, the following measures would be implemented:

   - For the duration of construction activities, actively disturbed areas would be stabilized through the use of water or chemical dust suppressants as required to meet dust control plans and permits issued by state and local regulators. Disturbed areas, including storage piles not being actively used for a period of 1 week or longer, would be stabilized as appropriate to minimize dust emissions. Active stabilization may not be required if soil moisture or natural crusting is sufficient to limit ambient impacts.

   - Bulk material stored onsite that is a possible fugitive dust source would be actively wetted, compacted, contoured, protected by wind breaks, controlled with chemical suppressants or a combination of these practices as needed, to minimize ambient impacts.

   - Onsite fugitive dust emissions would be limited by reducing vehicle speeds and a combination of active and passive dust suppression measures, including:

     - Onsite access roads, parking lots, and lay-down areas within the plant site would be maintained with a gravel cover or paved to the extent practical.

     - Unpaved roads and yards onsite and within linear ROWs would be watered as necessary when being used. If dust suppressants other than water were to be utilized, it would require prior approval by the BLM and possible NEPA analysis.

- Traffic would be restricted to the posted speed limit to minimize emissions from unpaved road segments.
- Combustion emissions from mobile sources would be minimized by proper maintenance and tune-up of equipment.

4. The project would comply with all applicable federal, state, and local laws and regulations concerning prevention and control of air pollution during facility operation. The project would receive a Prevention of Significant Deterioration (PSD) Permit prior to construction that would establish air emission rate limitations and specify air emission control technologies for facility operation.

5. Air emissions would be minimized through the design and use of air pollution control equipment, good operating practices, and pollution prevention methods, all as specified in the PSD Permit.

Landscape Preservation and Impact Avoidance

1. To the maximum extent practical, all trees, native shrubs, and other vegetation would be avoided or protected during construction operations except where clearing operations are required for structures and equipment, approved construction and permanent roads, construction yards and staging areas, and excavation operations.

2. All areas around water pipelines, wells, and transmission line structures would be backfilled, recontoured, and returned as close as possible to the original condition and grade.

3. Wherever possible stream channels, steep slopes, or sensitive environmental areas would not be used for equipment or materials storage or stockpiling; construction staging or maintenance; field offices; hazardous material or fuel storage, landfill or solid waste, handling, or transfer; or temporary access roads.

4. Excavated or graded materials would not be stockpiled or deposited on or within 100 feet of any steep slopes, where defined, or seasonally active ephemeral drainages.

5. The width of construction and new temporary access roads would be kept to the absolute minimum needed for operation, avoiding sensitive areas and trees where possible, and limiting disturbance to vegetation.

6. When and where applicable, landscaping standards, including clearing of native vegetation, would be followed as prescribed by local land use and management agencies when work is within their jurisdictions. The BLM Authorized Officer would specify required special handling and recovery techniques for yucca and some cactus in the southern part of the project on a site-specific basis.

7. Vegetation within utility rights-of-way would be managed for safe and reliable operation while maintaining vegetation and wildlife habitat.

Erosion and Sediment Control

1. Planting of native grasses, forbs, trees, or shrubs beneficial to wildlife, or placing of riprap and other materials as appropriate, would be used to prevent and minimize the potential for erosion and siltation during construction of project features and during the period needed to reestablish permanent vegetative cover on disturbed sites. Sediment fences would be used where appropriate to limit wind and water erosion, and water trucks or chemical suppressants, as approved by BLM, would be used in disturbed areas during construction to limit wind erosion.

2. Final erosion control and site restoration measures would be initiated as soon as practical after a particular area is no longer needed for construction, stockpiling, or access. Clearing schedules would be arranged to minimize exposure of soils.

3. Cuts and fills for access roads and utility corridors would be sloped to prevent erosion and to facilitate revegetation.

4. Signs would be placed along access roads to discourage off-road vehicle use and project personnel from driving into unauthorized adjacent areas.

5. Borrow areas would be contoured and shaped during rehabilitation to carry the natural contour of adjacent undisturbed terrain into the borrow area.

6. Soil or rock stockpiles, excavated materials, or excess soil materials would not be placed near sensitive habitats, including perennial, intermittent, and ephemeral drainage channels, where they may erode into these habitats or be washed away by high water or storm runoff. Long-term soil stockpiles would be revegetated to prevent wind and water erosion.

7. Treading on areas not immediately involved in project construction activities would be avoided to reduce potential wind erosion and fugitive dust generated during construction.

8. During periods of adverse soil moisture conditions, construction activities would be suspended to avoid excessive surface rutting.

Pipeline and Transmission Corridors

1. The upper 12 to 18 inches of soil would be removed, where existing soil and terrain conditions allow, from pipeline trench and transmission foundation excavation areas and stockpiled for later use in site restoration.

2. Surface elevations would be returned to approximate pre-project conditions as practicable. Pipeline trench backfill final grades would include provisions for settlement.

3. Where a pipeline and roads that service transmission right-of-way corridors cross fences, a wire gate would be installed to standard BLM specifications. The gates would be built prior to the construction activities and would be kept closed except during active construction at the fence site.

4. If construction activities cause damage to existing range improvements (such as pipelines, fences, troughs, etc.), they would be fixed using material that meets or

exceeds the quality of the existing improvement. If damage occurs, the BLM and livestock operator would be notified immediately. If damage occurs during active livestock grazing, repairs would be made within 24 hours.

5. In areas of frequent visitation by the public, the base of guy-wires on power poles would be fenced, and the first 10 feet of guy-wires would be marked with safety reflectors, high-visibility tape or plastic, or a similar material to make them highly visible to the public.

Biological Resources

1. Biological resources in the project area would be evaluated and the presence of any federally-listed endangered, threatened, or candidate species, state protected, and/or BLM sensitive species would be noted. The U.S. Fish and Wildlife Service (FWS) would be consulted per requirements of Section 7 of the Endangered Species Act (ESA). Measures would be incorporated into the project to avoid impacts to endangered, threatened, and candidate species and their habitats. Where such impacts cannot be avoided, the project final design, construction, and operation would include appropriate measures to minimize and mitigate impacts.

2. EEC would adhere to an integrated pest management plan prepared for the project and submitted as part of the overall Construction-Operations-Maintenance (COM) Plan.

3. The evaporation ponds on the power plant site would be fenced to exclude access by terrestrial wildlife species. In addition, the pond liner would be textured and there would be wildlife escape ramps at regular intervals on the liner. The evaporation pond would be monitored for water quality, use by wildlife, and possible adverse effects on wildlife resulting from exposure to potentially highly saline pond water. If necessary, measures that are designed to prevent or discourage wildlife from entering the pond would be initiated prior to when critical salinity levels are reached that could adversely impact wildlife. Examples of such measures include electronic sound devices that mimic predatory bird calls, visual scare tactics, and propane noise cannons. The monitoring program and protective measures that would be implemented, if needed, would be described in the COM Plan. The process would be completed in consultation with BLM and U.S. Fish and Wildlife biologists.

4. Current science, guidelines, and methodologies (Avian Power Line Interaction Committee 1994, 1996, 2005) would be used for all new and existing powerlines to minimize raptor and other bird electrocution and collision potential.

5. Avoid line-of-sight views between the power poles along powerlines and sage grouse leks, whenever feasible.

Cultural Resources

Specific cultural resource inventory and protection measures to be employed for the EEC are outlined in the project-specific Cultural Resources Programmatic Agreement. The Programmatic Agreement is on file at the BLM's Ely, Elko, and Southern Nevada District Offices, the Nevada State Historic Preservation Office, and the City of Ely.

The general guidance for Treatment of Historic Properties from Section C of the Programmatic Agreement is as follows:

1. In avoiding or mitigating effects for other types of properties, BLM Ely, in consultation with SHPO and in coordination with identified interested persons, shall determine the nature of effects to historic properties identified in the APE if the EEC project is approved by the BLM. All treatment shall be done in a manner consistent with the Nevada BLM/SHPO Protocol.

2. BLM Ely, to the extent practicable, and in consultation with the SHPO, shall ensure that Nevada Power avoid effects to historic properties through project design, or redesign, relocation of facilities, or by other means.

3. When avoidance is not feasible, BLM Ely, in consultation with SHPO and in coordination with Nevada Power and interested persons, shall develop, or ensure that Nevada Power develops, an appropriate treatment plan designed to lessen or mitigate project-related effects to historic properties. For properties eligible under criteria (a) through (c) (36 CFR 60.4), mitigation, other than data recovery may be considered in the treatment plan (e.g., HABS/HAER recordation, oral history, historic markers, exhibits, interpretive brochures or publications, etc.). Where appropriate, treatment plans shall include provisions (content and number of copies) for a publication for the general public.

4. When data recovery is required as a condition of approval, BLM Ely, in consultation with SHPO, shall develop, or ensure that Nevada Power develops treatment plans that are consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 447 16-37) and *Treatment of Historic Properties: A Handbook* (Advisory Council 1980).

5. BLM Ely shall ensure that all records and materials resulting from identification and treatment efforts are curated in accordance with 36 CFR 79 in BLM-approved facilities. All materials slated for curation will be maintained in accordance with 36 CFR 79 until the relevant final treatment report is complete and collections are curated or returned to their owners. The BLM and Nevada Power shall encourage private owners to donate collections obtained from their lands to an appropriate curation facility.

6. BLM Ely shall consult with appropriate tribes per BLM Manual 8120-1 and SHPO to develop treatment options for Traditional Cultural Properties or properties considered to be of traditional religious and cultural importance in areas that would be directly or indirectly affected by the EEC.

7. BLM Ely shall ensure that all final reports resulting from treatment will be provided to the SHPO, and made available to Indian Tribes, and other interested persons, as appropriate. All such reports shall be consistent with contemporary professional standards and the Department of Interior's Formal Standards for Final Reports of Data Recovery Programs (42 FR 5 3 77-79).

Paleontological Resources

1. If paleontological resources are discovered during construction, the BLM would be notified immediately and measures taken to protect the resource. A 50-meter buffer would be left around any discovery and work would not resume until authorization is given by an authorized officer. The significance of the resource would be evaluated and whether or not avoidance was possible. Stabilization and measures to mitigate construction damage might also be required even if avoidance was possible. Should avoidance prove infeasible, further procedures to protect the resource would be determined by the BLM.

2. See the project-specific Paleontological Resource Management Plan (PRIMP) for specific paleontological resource protection measures to be employed for the EEC.

Noxious and Non-native, Invasive Weed Management

1. A noxious and non-native, invasive weed survey would be completed prior to any earth disturbing activity including cross-country travel. Noxious or non-native, invasive weeds that may be located on the site would be managed according to methods to be approved by the BLM Authorized Officer. Should chemical methods be approved, the lessee must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date. A Pesticide Application Report must be submitted to the Authorized Officer by the end of each fiscal year following chemical application.

2. To eliminate the introduction of noxious and non-native, invasive weed seeds, roots, or rhizomes; all straw, hay, straw/hay, or other organic products used for reclamation or stabilization activities would be certified free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office.

3. To eliminate the introduction of noxious and non-native, invasive weed seeds, roots, or rhizomes; all source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials used for construction, maintenance, or reclamation would be inspected and found to be free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office. Inspections would be conducted by a BLM-approved weed scientist or qualified biologist.

4. To eliminate the transport of vehicle-borne noxious and non-native, invasive weed seeds, roots, or rhizomes, all vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities would be cleaned of soil and debris capable of transporting weed propagules prior to entering or leaving the work site or project area in a manner acceptable to the Field Office Weed Coordinator or designated contact person.

5. Prior to entry of vehicles and equipment to a project area, areas of concern would be identified, flagged, and recorded in the field by a weed scientist or qualified biologist in a manner acceptable to the Field Office Weed Coordinator or designated contact person.

6. Prior to entering public lands, the contractor, operator, or permit holder would provide information and training regarding noxious and non-native, invasive weed management and identification to all personnel who would be affiliated with the implementation and maintenance phases of the project. The importance of preventing the spread of weeds to

uninfested areas and the importance of controlling existing populations of weeds would be explained.

7. To eliminate the transport of soil-borne noxious and non-native, invasive weed seeds, roots, or rhizomes, infested soils or materials would not be moved and redistributed on weed-free or relatively weed-free areas. In areas where infestations are identified or noted and infested soils, rock, or overburden must be moved, these materials would be salvaged and stockpiled adjacent to the area from which they were stripped. Appropriate measures would be taken to minimize wind and water erosion of these stockpiles. During reclamation, the materials would be returned to the area from which they were stripped.

8. Prior to project approval, a site-specific noxious and non-native, invasive weed survey would occur and a weed risk assessment would be completed. Monitoring would be conducted for a period no shorter than the life of the permit or until bond release and monitoring reports would be provided to the BLM. If the spread of noxious and non-native, invasive weeds is noted on project areas, appropriated weed control procedures would be determined in consultation with BLM personnel and would be in compliance with the appropriate BLM Handbook sections and applicable laws and regulations. All weed control efforts on BLM-administered lands would be in compliance with BLM Handbook H-9011, H-9011-1 Chemical Pest Control, H-9014 Use of Biological Control Agents of Pests on Public Lands, and H-9015 Integrated Pest Management. A pesticide Application Report must be submitted to the Authorized Officer by the end of the fiscal year following any chemical application.

9. For mineral activity, bonds for weed control would be retained until the site is returned to desired vegetative conditions.

10. Removal and disturbance of vegetation would be kept to a minimum through construction site management (e.g. using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.)

11. Mixing of herbicides and rinsing of herbicide containers and spray equipment would be conducted only in areas that are safe distance from environmentally sensitive areas and points of entry to bodies of water (storm drains, irrigation ditches, streams, lakes, or wells).

12. Methods used to accomplish weed and insect control objectives would consider seasonal distribution of large wildlife species.

13. When managing weeds in areas of special status species, impacts of the treatment on such species would be carefully considered. Wherever possible, hand spraying of herbicides would be the preferred method in compliance with an approved Integrated Weed Management Plan and associated environmental impact analyses.

Reclamation

1. Reclamation would normally be accomplished with native species, if available. These would be representative of the indigenous species present in the adjacent habitat. Rationale for potential planting with selected non-natives would be documented. Possible exceptions could include use of non-natives for a temporary cover crop to out-compete weeds.

2. Seeding would occur during October 15 through March 15 to ensure a greater chance of success.

3. Reclamation release criteria are as follows:

   - Achieve 100 percent of the baseline perennial plant cover of selected comparison areas, normally like adjacent habitat. If the adjacent habitat is severely disturbed, a range site description may be used as a cover standard. Cover is normally crown cover as estimated by the point intercept method. Selected cover can be determined using a method as described in *Sampling Vegetation Attributes, Interagency Technical Reference* (1996, BLM/RS/ST-96/002+1730). The reclamation plan for the project area would identify the site-specific release criteria and associated statistical methods in the reclamation plan or permit.

   - No noxious and non-native, invasive weeds would be allowed on the sites for reclamation release. Control of noxious and non-native, invasive weeds would follow an integrated pest management plan approved by the authorizing officer. A list of Nevada noxious weeds would be provided by the authorized officer.

4. Up to the first 12 to 18 inches of growth medium would be salvaged, were soil and terrain conditions allow, and stockpiled prior to disturbance for all areas to be reclaimed after construction. All disturbance areas to be reclaimed would be recontoured to blend as nearly as possible with the natural topography prior to revegetation. All compacted portions of the disturbance would be ripped to a depth of 12 inches unless solid rock is encountered. Adequate, fine-grain seedbed would be established to provide good seed to soil contact. Large blocks and clumps of soil with deep pockets would be avoided. This normally requires some type of tillage procedure after ripping.

5. All portions of access roads not needed for other uses as determined by the authorized officer would be reclaimed.

6. Mulching of the seedbed following seeding may be required under certain conditions, such as severe erosion.

7. Respread weed-free vegetation removed from the right-of-way to provide protection, nutrient recycling, and seed source.

8. The success of the vegetative growth on a reclaimed site may be evaluated for release no sooner than during the third growing season after earthwork and planting have been completed. Where it has been determined that revegetation success criteria have not been met, the agencies and the operator would meet to decide on the best course of actions necessary to meet the reclamation goal.

9. Where applicable, the following agencies would be consulted to determine the recommended plant species composition, seeding rates, and planting dates:

   - U.S. Fish and Wildlife Service
   - U.S. Natural Resources Conservation Service
   - U.S. Bureau of Land Management
   - Nevada Department of Wildlife

10. Grasses, forbs, shrubs, and trees appropriate for site conditions and surrounding vegetation would be included on the BLM-approved plant and seed mix list. Species chosen for a site would be matched for site drainage, climate, shading, resistance to erosion, soil type, slope, aspect, and vegetation management goals. Upland revegetation shall match the plant list to the site's soil type, topographic position, elevation, and surrounding natural communities.

11. Construction areas, including storage yards, would be free of waste material and trash accumulations, unless stored in appropriate containers.

12. All unused materials and solid waste would be removed from construction and storage sites during the final phase of work. Unused material may be sold or relocated to other work sites other than the EEC. Solid waste would be placed in permitted solid waste management facilities.

13. Upon completion of construction, any land disturbed would be graded to provide proper drainage and blend with the natural contour of the land. Following grading, it would be revegetated using plants native to the area, suitable for the site conditions, and beneficial to wildlife.

14. Following completion of construction, all temporary construction yards, offices, and related buildings, including temporary concrete footings and slabs, would be removed from the site.

15. All construction roads not needed for ongoing operations and maintenance activities would be obliterated and restored to the original contour, and made to discourage vehicular traffic when no longer needed for construction. Culverts would be removed as appropriate, road escarpments would be contoured and vegetated, and all road surfaces would be scarified to establish conditions appropriate for reseeding, drainage, and erosion prevention.

Visual Resources

1. All outside surfaces of structures, stacks, buildings, and tanks would be constructed of materials that would restrict glare, and would be finished with flat tones intended to blend with the surrounding predominantly rural environment. EEC would consult with White Pine County and BLM regarding the final selection of colors for the features of the plant site. The standard environmental colors chart, CC-001 June 2008 (Standard Environmental Colors), would be used, especially for remote facilities.

2. All fencing would be constructed of non-reflective materials. No white top fence posts would be used.

3. Signs at the plant site would be constructed of materials that are non-glare, and would be painted using unobtrusive colors. This requirement shall not apply to safety signs (e.g., brightly colored signs indicating the presence of a hazard.)

4. Permanent outdoor lighting would be limited to areas required for operations, maintenance, safety and security, and would be anti-glare, shielded, and directed downward to the extent possible. Highly directional, high-pressure sodium vapor fixtures (or other fixtures that meet the criteria specified) would be used where practical. Switches or photocells would be used as appropriate on outdoor lighting to allow use of lighting only when needed. Lighting techniques would include using directional lights that do not allow lights to shine into the sky, screening lights, using timers and motion detectors so that lights are only on when necessary, and systems that minimize lighting to only meet functional requirements.

5. The transmission structures would be finished with flat, neutral colors that would blend with the surrounding environment and that would relate to the colors of the structures in the existing transmission corridors.

6. Unless required for worker safety, non-specular conductors and non-reflective and non-refractive insulators would be used to reduce conductor and insulator visibility.

7. In areas of frequent visitation by the public, the base of guy-wires on power poles would be fenced, and the first 10 feet of guy-wires would be marked with safety reflectors, high-visibility tape or plastic, or a similar material to make them highly visible to the public..

8. During the implementation of vegetation treatments, irregular margins would be created around treatment areas to better maintain the existing scenic character of the landscape.

Water Pollution Prevention and Monitoring

1. Water needs during facility operation (up to 8,000 acre-feet annually) would be supplied through water rights that have been permitted by the Nevada State Engineer. Water needs during facility construction would be supplied by one or more construction water wells or transported by truck from other local water sources.

2. A ground water monitoring program would be developed by EEC in cooperation with the Nevada State Engineer. Results of monitoring would be provided to the BLM and the Nevada State Engineer annually to evaluate the effects of the withdrawal of ground water resources.

3. Pumped ground water would be monitored periodically (as stipulated in the final Construction, Operation, and Maintenance Plan) to ensure its quality is suitable for power plant operation, including its use as potable water supplies for plant employees, boiler feedwater makeup, cooling water makeup, pollution control, and other beneficial uses to support the operation of the facility.

4. All federal and state laws related to control and abatement of water pollution would be complied with. All waste material and sewage from construction activities or project-related features would be disposed of according to federal and state pollution control regulations.

5. All disturbed drainage channels would be reclaimed as soon as practical, to a standard for aesthetic value comparable to what existed prior to disturbance. Where appropriate, native species capable of bank stabilization would be used to revegetate all disturbed stream banks.

6. Diversion structures would be used to re-direct flows from any drainages potentially impacted by facility features and would be designed to minimize potential destabilization and erosion of adjacent and downgradient drainages.

7. Stormwater management plans would be implemented for project construction and facility operation to minimize and control erosion from stormwater runoff. During project construction, stormwater would be managed in compliance with applicable state and federal regulations, including compliance with requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater general permits, which would be obtained for the project. Stormwater management elements would include:

   - Application of best management practices for erosion, sedimentation, and stabilization control during construction activities, and management of oils and other substances during operation to minimize contact with stormwater;
   - Structural controls during operation that could include stabilized stormwater conveyance systems (swales), oil-water separators for runoff that comes in contact with affected plant site surfaces, and sedimentation detention basins;
   - Monitoring and maintenance to ensure long-term effectiveness of the management system.

8. EEC would be a zero liquid discharge (ZLD) site for construction and operation. Stormwater retention basins would be constructed at the plant site with sufficient dimensions to contain, without discharge, runoff from the impervious surfaces at the plant site generated by the local maximum daily rainfall event with a return frequency of 100 years 24 hours. One or more contact stormwater and process water stormwater retention basins would be constructed to withstand a worse-case 24-hour, 100-year storm re-occurrence interval. All contact stormwater runoff from the impervious surfaces would be directed to the retention basins. Non-contact stormwater would be diverted to existing natural drainage.

9. Construction specifications would require construction methods that prevent pollutants from accidentally entering or spilling into flowing or dry watercourses, and ground water sources. Potential pollutants and wastes include refuse, garbage, cement, concrete, sewage effluent, industrial waste, oil and other petroleum products, aggregate processing tailings, mineral salts, drilling mud, and thermal pollution.

10. A detailed containment plan would be developed and included in the COM Plan for the disposal of drilling mud and test-drilling water associated with and removed during the drilling of ground water wells.

11. Any construction wastewater from aggregate processing, concrete batching, or other construction operations would be directed to on-site retention basins designed for zero discharge. The water may be reclaimed for construction purposes or evaporated. The residual as a result of evaporation would be removed and placed in the plant site's combustion byproducts landfill, in accordance with the landfill permit.

Noise Prevention

1. The facility would be designed to operate in compliance with all applicable federal, state, and local laws and regulations related to noise.

2. Personnel would be required to comply with all applicable federal, state, and local laws and regulations concerning prevention and control of noise during project construction and operation.

Hazardous Material Storage, Handling, and Disposal and Safety Measures

1. Personnel, contractors, and transporters involved with hazardous materials management would be required to comply with federal and state regulations established for the transportation, storage, handling and disposal of hazardous substances, materials and wastes.

2. "Hazardous material" means any substance, pollutant, or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 USC 9601 et seq., and its regulations (CERCLA). The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended 42 USC 6901 et seq., and its regulations.

3. Process wastewater and Stormwater retention basin solid precipitant would be periodically removed, as necessary, and transported to the on-site combustion byproducts landfill in accordance with the landfill permit. Dust control would be employed, as necessary, during the precipitant handling activities.

4. Aboveground chemical tanks would be located within a containment structure that is lined and bermed, and that is sufficient to contain a release from the largest tank within the area, plus sufficient freeboard to prevent overflow. Markings or signs on tanks or the containment structure would identify hazards of the chemicals being managed. Tanks would be registered, as necessary, constructed, and managed using accepted engineering best practices, which may include high-level alarms or indicators to prevent overflow and locking valves. Tanks would be subject to a regular inspection regime (as stipulated in the final COM Plan). The potential for adverse impacts from oil and fuel spills would be reduced through careful handling and designation of specific equipment repair and fuel storage areas. In the event that hazardous or regulated materials such as diesel fuel are spilled, measures would be taken to control the spill and the National Response Center and/or Nevada Department of Environmental Protection would be notified immediately.

5. The permittee is responsible for clean-up and assumes liability for any and all releases of hazardous substances disposed on public land in accordance with State, Federal and Local laws and regulations. Permittee will immediately notify the BLM Authorized Officer of any and all releases of hazardous substances on public land.

6. Outdoor oil storage areas would be bermed with a capacity sufficient to contain the oil inventory contained in the single largest tank/equipment plus sufficient freeboard to prevent overflow. Outlets from these containment areas would be equipped with a

normally closed valve. Regular inspections would determine if there had been a leak requiring special attention. Otherwise, the valve would be opened to drain any rainwater to a plant oil/water separator. Any oil collected in the separator would be pumped out and removed by a licensed oil disposal contractor.

7. Outdoor chemical and hazardous waste storage tanks and containers would be within diked containment areas. Chemicals and wastes would be stored in accordance with the fire safety, hazardous materials management, and hazardous waste management standards of practice, which include segregation of incompatibles, protection of water-reactive materials from precipitation or moisture, adequate aisle space, etc.

8. Waste materials known or found to be hazardous would be disposed of in an approved off-site, permitted treatment or disposal facilities in accordance with federal, state, and local regulations, standards, codes, and laws.

9. Solid waste would be stored in onsite roll-off bins. Recyclable materials would be separated from the solid waste stream, if local recycling agreements are practical. Solid waste would be collected periodically and transported to an approved local licensed landfill.

10. Generation of wastes during construction would be minimized through detailed estimating of materials needed and through efficient construction practices. Wastes generated during construction would be recycled to the extent feasible. Concrete waste would be used as fill onsite, or, if not suitable for reuse, would be removed to a local licensed landfill. Non-recyclable wastes would be collected and transported to a local licensed landfill.

11. Fuels, lubricant chemicals, and welding gases used during construction would be in controlled storage until used. Any empty containers or waste material would be segregated in storage and properly recycled or disposed of by licensed handlers.

12. Concrete trucks would be washed only at designated sites along ROWs and at the plant site where wastes would be contained.

13. Portable toilets or a packaged treatment system would be provided for onsite sewage handling during construction at the plant site. Portable toilets would be provided at construction locations along the ROWs. Sewage from the portable toilets would be removed regularly and disposed of in accordance with applicable federal and state pollution control regulations. There shall be no dumping of black water, sewage or litter. During facility operation, sewage from plant employees would be collected and treated using an on-site treatment system.

14. A Spill Prevention Control and Countermeasures Plan (SPCC) would be in place and maintained for plant operations.

15. Operators of the EEC would provide first response fire and emergency medical equipment and services for the project. The operators would also coordinate with local police, fire, and ambulance districts to provide additional personnel and services to the project.

16. A containment barrier would be constructed around all pumps and fuel containers utilized within 100 feet (30.5 meters) of a stream channel or spring. The containment barrier would be of sufficient size to contain all fuel being stored or used on site.

Socioeconomics

1. The EEC Proponents would enter into a cooperative agreement with White Pine County and other local communities to conduct a detailed assessment of the socioeconomic impacts of the EEC on county and local services, and develop a plan to mitigate these impacts. The results of this assessment and proposed mitigation measures would be provided to the BLM Authorized Officer.

Appendix 3A
Noxious and Non-native, Invasive Weeds

Table 1. Federal Noxious Weeds List

COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
Aquatic/Wetland			
Mosquito fern	*Azolla pinnata*	Heartshape false pickerelweed	*Monochoria vaginalis*
Mediterranean strain	*Caulerpa taxifolia*	Ducklettuce	*Ottelia alismoides*
Anchored waterhyacinth	*Eichornia azurea*	Arrowhead	*Sagittaria sagittifolia*
Hydrilla	*Hydrilla verticillata*	Giant salvinia	*Salvinia auriculata*
Miramar weed	*Hygrophila polysperma*	Giant salvinia	*Salvinia biloba*
Water-spinach	*Ipomoea aquatica*	Giant salvinia	*Salvinia herzogii*
Moss	*Lagarosiphon major*	Giant salvinia	*Salvinia molesta*
Ambulia	*Limnophila sessiliflora*	Wetland nightshade	*Solanum tampicense*
Broadleaf paper bark tree	*Melaleuca quinquenervia*	Exotic bur-reed	*Sparganium erectum*
Arrowleaf false pickerelweed	*Monochoria hastata*		
Parasitic			
Aeginetia	*Aeginetia spp.*	Broomrape	*Orobanche spp.* (selected)
Alectra	*Alectra spp.*	Witchweeds	*Striga spp.*
Dodder	*Cuscuta spp.* (selected)		
Terrestrial			
Crofton weed	*Ageratina adenophora*	Prosopis	*Prosopis articulata*
Sessile joyweed	*Alternanthera sessilis*	Prosopis	*Prosopis caldenia*
Onionweed	*Asphodelus fistulosus*	Cusqui	*Prosopis calingastana*
Animated oat, wild oat	*Avena sterilis*	Prosopis	*Prosopis campestris*
Wild safflower	*Carthamus oxyacantha*	Prosopis	*Prosopis castellanosii*
Pilipiliula	*Chrysopogon aciculatus*	Prosopis	*Prosopis denudans*
Benghal dayflower	*Commelina benghalensis*	Prosopis	*Prosopis elata*
Common crupina	*Crupina vulgaris*	Syrian mesquite	*Prosopis farcta*
African couchgrass	*Digitaria scalarum*	Prosopis	*Prosopis ferox*
Velvet fingergrass	*Digitaria velutina*	Prosopis	*Prosopis fiebrigii*
Lightning weed	*Drymaria arenarioides*	Prosopis	*Prosopis hassleri*
Three-cornered jack	*Emex australis*	Prosopis	*Prosopis humilis*
Devil's thorn	*Galega officinalis*	Prosopis	*Prosopis kuntzei*
Giant hogweed	*Heracleum mantegazzianum*	Kiawe	*Prosopis pallida*
Homeria	*Homeria spp.*	Prosopis	*Prosopis palmeri*
Brazilian satintail	*Imperata brasiliensis*	Tornillo	*Prosopis reptans*
Cogongrass	*Imperata cylindrical*	Prosopis	*Prosopis rojasiana*
Murainograss	*Ischaemum rugosum*	Prosopis	*Prosopis ruizlealii*
Asian sprangletop	*Leptochloa chinensis*	Prosopis	*Prosopis ruscifolia*
African boxthorn	*Lycium ferocissimum*	Prosopis	*Prosopis sericantha*
Melastoma	*Melastoma malabathricum*	Argentine screwbean	*Prosopis strombulifera*
Mile-a-minute	*Mikania cordata*	Prosopis	*Prosopis torquata*
Giant sensitive plant	*Mimosa invisa*	Itchgrass	*Rottboellia cochinchinensis*
Catclaw mimosa	*Mimosa pigra*	Wild blackberry	*Rubus fruticosus*
Serrated tussock	*Nassella trichotoma*	Wild raspberry	*Rubus moluccanus*
Jointed prickly pear	*Opuntia aurantiaca*	Wild sugarcane	*Saccharum spontaneum*
Red rice	*Oryza longistaminata*	Wormleaf salsola	*Salsola spontaneum*
Red rice	*Oryza punctata*	South African ragwort	*Senecio inaequidens*

Red rice	*Oryza rufipogon*	Madagascar ragwort	*Senecio madagascariensis*
Kodo-millet	*Paspalum scrobiculatum*	Cattail grass	*Setaria pallide-fusca*
Kikuyugrass	*Pennisetum clandestinum*	Turkeyberry	*Solanum torvum*
African feathergrass	*Pennisetum macrourum*	Tropical soda apple	*Solanum viarum*
Missiongrass	*Pennisetum polystachion*	Winged false buttonweed	*Spermacoce alata*
Prosopis	*Prosopis alpataco*	Coat buttons	*Tridax procumbens*
Prosopis	*Prosopis argentina*	Liverseed grass	*Urochloa panicoides*

Source: http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/index.shtml

Table 2. Nevada Department of Agriculture Noxious Weeds List

COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
Category A Weeds[1]			
African rue	*Peganum harmala*	Leafy spurge	*Euphorbia esula*
Austrian fieldcress	*Rorippa austriaca*	Malta star thistle	*Centaurea melitensis*
Austrian peaweed	*Sphaerophysa salsula/ Swainsona salsula*	Mayweed chamomile	*Anthemis cotula*
Camelthorn	*Alhagi camelorum*	Mediterranean sage	*Salvia aethiopis*
Common crupina	*Crupina vulgaris*	Purple loosestrife	*Lythrum salicaria, L. virgatum*
Dalmation toadflax	*Linaria dalmatica*	Purple star thistle	*Centaurea calcitrapa*
Dyer's woad	*Isatis tinctoria*	Rush skeletonweed	*Chondrilla juncea*
Eurasian water-milfoil	*Myriophyllum spicatum*	Sow thistle	*Sonchus arvensis*
Giant reed	*Arundo donax*	Spotted knapweed	*Centaurea masculosa*
Giant salvinia	*Salvinia molesta*	Squarrose star thistle	*Centaurea virgata Lam. Var. squarrose*
Goats rue	*Galega officinalis*	Sulfur cinquefoil	*Potentilla recta*
Houndstongue	*Cynoglossum officinale*	Syrian bean caper	*Zygophyllum fabago*
Hydrilla	*Hydrilla verticillata*	Yellow star thistle	*Centaurea solstiltialis*
Iberian star thistle	*Centaurea iberica*	Yellow toadflax	*Linaria vulgaris*
Klamath weed	*Hypericum perforatum*		
Category B Weeds[2]			
Carolina horse-nettle	*Solanum carolinense*	Russian knapweed	*Acroptilon repens*
Diffuse knapweed	*Centaurea diffusa*	Scotch thistle	*Onopordum acanthium*
Medusahead	*Taeniatherum caput-medusae*	White horse-nettle	*Solanum elaeagnifolium*
Musk thistle	*Carduus nutans*		
Category C Weeds[3]			
Black henbane	*Hyoscyamus niger*	Perennial pepperweed	*Lepidium latifolium*
Canada thistle	*Cirsium arvense*	Poison hemlock	*Conium maculatum*
Green fountain grass	*Pennisetum setaceum*	Puncture vine	*Tribulus terrestris*
Hoary cress	*Cardaria draba*	Salt cedar (tamarisk)	*Tamarix ramosissima*
Johnson grass	*Sorghum halepense*	Water hemlock	*Cicuta maculata*

[1] Weeds not found or limited in distribution throughout the State; actively excluded from the State and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the State in all infestations.

[2] Weeds established in scattered populations in some counties of the State; actively excluded where possible; actively eradicated from nursery stock dealer premises; control required by the State in areas where populations are not well established or previously unknown to occur.

[3] Weeds currently established and generally widespread in many counties of the State; actively eradicated from nursery stock dealer premises; abatement at the discretion of the State quarantine officer.

Source: http://agri.nv.gov/nwac/PLANT_NoxWeedList.htm

Table 3. BLM Invasive Weed Species of Concern

COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
Grasses			
Jointed goatgrass	*Aegilops cylindrica*	Veldt grass	*Ehrharta calycina*
European beachgrass	*Ammophila arenaria*	Quackgrass	*Elytrigia repens*
Giant reed	*Arundo donax*	Lehmann lovegrass	*Eragrostis lehmanniana*
Ripgut brome	*Bromus diandrus*	Matgrass	*Nardus stricta*
Japanese brome	*Bromus japonicus*	Wild proso millet	*Panicum miliaceum*
Red brome	*Bromus rubens*	Crimson fountain grass	*Pennisetum setaceum*
Downy brome	*Bromus tectorum*	Schismum	*Schismus arabicus*
Longspine sandbur	*Cenchrus longispinus*	Mediterranean grass	*Schismus barbatus*
Andean pampas grass	*Cortaderia jubata*	Johnsongrass	*Sorghum halepense*
Pampas grass	*Cortaderia selloana*	Medusa-head	*Taeniatherum caput-medusae*
Bermudagrass	*Cynodon dactylon*		
Forbs			
Russian knapweed	*Acroptilon repens*	Chicory	*Cichorium intybus*
Scentless chamomile	*Anthemis arvensis*	Bull thistle	*Cirsium vulgare*
Mayweed chamomile	*Anthemis cotula*	Chinese clematis	*Clematis orientalis*
Common burdock	*Arctium minus*	Poison hemlock	*Conium maculatum*
Bassia	*Bassia hyssopifolia*	Field bindweed	*Convolvulus arvensis*
Black mustard	*Brassica nigra*	Bristly hawkweed	*Crepis setosa*
Wild turnip	*Brassica tournefortii*	Common crupina	*Crupina vulgaris*
Mexican bird-of-paradise	*Caesalpinia gilliesii*	Artichoke thistle	*Cynara cardunculus*
Lens-podded whitetop	*Cardaria chalepensis*	Houndstongue	*Cynoglossum officinale*
Hoary cress	*Cardaria draba*	Foxglove	*Digitalis purpurea*
Hairy whitetop	*Cardaria pubescens*	Common teasel	*Dipsacus fullonum*
Plumeless thistle	*Carduus acanthoides*	Blueweed	*Echium vulgare*
Musk thistle	*Carduus nutans*	Brazillian waterweed	*Egeria densa*
Italian thistle	*Carduus pycnocephalus*	Water hyacinth	*Eichhornia crassipes*
Slender-flowered thistle	*Carduus teniflorus*	Australian fireweed	*Erechtites glomerata*
Hottentot fig	*Carpobrotus edulis*	Cypress spurge	*Euphorbia cyparissias*
Sea iceplant	*Carpobrotus chilensis*	Leafy spurge	*Euphorbia esula*
Distaff thistle	*Carthamus lantus*	Myrtle spurge	*Euphorbia myrsinites*
Common caraway	*Carum carvi*	Fennel	*Foeniculum vulgare*
Purple starthistle	*Centaurea calcitrapa*	Goat's rue	*Galega officinalis*
Cornflower	*Centaurea cyanus*	Baby's breath	*Gypsophila paniculata*
Diffuse knapweed	*Centaurea diffusa*	Halogeton	*Halogeton glomeratus*
Iberian starthistle	*Centaurea iberica*	Dames's rocket	*Hesperis matronalis*
Brown knapweed	*Centaurea jacea*	Orange hawkweed	*Hieracium aurantiacum*
Bighead knapweed	*Centaurea macrocephala*	Mouseear hawkweed	*Hieracium pilosella*
Spotted knapweed	*Centaurea maculosa*	Yellow hawkweed	*Hieracium pretense*
Malta starthistle	*Centaurea melitenisis*	Hydrilla	*Hydrilla verticillata*
Mountain cornflower	*Centaurea montana*	Black henbane	*Hyoscyamus niger*
Black knapweed	*Centaurea nigra*	Common St. Johnswort	*Hypericum perforatum*
Vochin knapweed	*Centaurea nigrescens*	Common catsear	*Hyposhaeris radicata*
Meadow knapweed	*Centaurea pratensis*	Dyer's woad	*Isatis tinctoria*
Squarrose knapweed	*Centaurea squarrosa*	Blue buttons	*Knautia arvensis*
Yellow starthistle	*Centaurea solstitialis*	Everlasting peavine	*Lathyrus latifolius*
Feather-headed knapweed	*Centaurea trichocephala*	Perennial pepperweed	*Lepidium latifolium*
Rush skeletonweed	*Chondrilla juncea*	Dalmation toadflax	*Linaria genistifolia spp. dalmatica*
Ox-eye daisy	*Chrysanthemum leucanthemum*		

Forbs (cont.)			
Yellow toadflax	*Linaria vulgaris*	Mediterranean sage	*Salvia aethiopsis*
Garden loosestrife	*Lysimachia vulgaris*	Bouncing bet	*Saponaria officinalis*
Purple loosestrife	*Lythrum salicaria*	Tansy ragwort	*Senecio jacobaea*
Wand loosestrife	*Lythrum virgatum*	German ivy	*Senecio mikanoides*
Chilean tarweed	*Madia sativa*	Bitter nightshade	*Solanum dulcamara*
Eurasian watermilfoil	*Myriophyllum spicatum*	Perennial sowthistle	*Sonchus arvensis*
Scotch thistle	*Onopordum acanthium*	Swainsonpea	*Sphaerophysa salsula*
Scotch thistle	*Onopordum taricum*	Common tansy	*Tanacetum vulgare*
African rue	*Peganum harmala*	Syrian bean caper	*Zygophyllum fabago*
Sulfur cinquefoil	*Potentilla recta*		
Shrubs and Trees			
Tree-of-heaven	*Ailanthus altissima*	Himalaya blackberry	*Rubus discolor*
Camelthorn	*Alhagi pseudalhagi*	Brazilian pepper	*Schinus terebrinthifolius*
Spanish broom	*Cytisus junceum*	Athel	*Tamarix aphylla*
French broom	*Cytisus monspessulanas*	Tamarisk	*Tamarix chinensis*
Scotch broom	*Cytisus scoparius*	French tamarisk	*Tamarix gallica*
Portuguese broom	*Cytisus striatus*	Small flower tamarisk	*Tamarix parviflora*
Russian olive	*Elaeagnus angustifolia*	Tamarisk	*Tamarix pentada*
Edible fig	*Ficus carica*	Salt cedar	*Tamarix ramosissima*
Himalaya bush cover	*Lespedeza cuneata*	Gorse	*Ulex europaeus*
Bridal veil broom	*Retama monosperma*	Siberian elm	*Ulmus pumila*

Source: http://www.blm.gov/co/st/en/BLM_Programs/botany/invasiweed.html

Appendix 3B
Wildlife Species Observed, TEPC Species, and Sensitive Species

Table 1 - WILDLIFE SPECIES OBSERVED BY JBR DURING BASELINE SURVEYS

Date	Species	Location	Notes
AVIAN			
11/8/2006	Black-Throated Sparrow	ALT - Segment 10 Transmission Line	S half of Kane Springs valley
11/16/2006	California Quail	ALT - Segment 10 Transmission Line	Gregorsian Basin; NW corner
11/0/2006	California Quail	ALT - Segment 10 Transmission Line	Elgin SW; Very S end
11/17/2006	Dark-eyed Juncos	ALT - Segment 10 Transmission Line	Observed
11/8/2006	House Finch	ALT - Segment 10 Transmission Line	S half of Kane Springs valley
11/16/2006	Raven	ALT - Segment 10 Transmission Line	Delmar NW; All on power line coming into corridor
6/28/2007	Flicker	ALT - Segment 1A Transmission Line	Observed
6/28/2007	Horned Larks	ALT - Segment 1A Transmission Line	Observed
6/28/2007	Sage Sparrows	ALT - Segment 1A Transmission Line	Observed
6/28/2007	Western Kingbirds	ALT - Segment 1A Transmission Line	Over diversion below RF-22
6/28/2007	Western Meadowlarks	ALT - Segment 1A Transmission Line	Calling by Duck Creek
10/11/2006	Barn Swallow	ALT - Segment 3 Transmission Line	S over pond
10/10/2006	Barn Swallows	ALT - Segment 3 Transmission Line	S over old RR tracks
10/10/2006	Barn Swallows	ALT - Segment 3 Transmission Line	Observed flying in Area
10/11/2006	Barn Swallows	ALT - Segment 3 Transmission Line	Observed in Area
10/11/2006	Black-billed Magpies	ALT - Segment 3 Transmission Line	Observed in Area
10/11/2006	Brewer's Blackbirds	ALT - Segment 3 Transmission Line	Observed in adjacent agricultural land
10/11/2006	Brewer's Blackbirds	ALT - Segment 3 Transmission Line	SE of GPS 627
10/11/2006	Brewer's Blackbirds	ALT - Segment 3 Transmission Line	Near Schell Creek
10/11/2006	Brewer's Blackbirds	ALT - Segment 3 Transmission Line	Observed in Area
10/11/2006	California Quail	ALT - Segment 3 Transmission Line	Observed
10/10/2006	Flicker	ALT - Segment 3 Transmission Line	Basset Lake
10/11/2006	Flicker	ALT - Segment 3 Transmission Line	Heard calling in area
10/11/2006	Flicker	ALT - Segment 3 Transmission Line	Calling to the E
10/11/2006	Horned Lark	ALT - Segment 3 Transmission Line	Observed
10/10/2006	Horned Larks	ALT - Segment 3 Transmission Line	100+ birds
10/10/2006	Horned Larks	ALT - Segment 3 Transmission Line	In Area
10/10/2006	Horned Larks	ALT - Segment 3 Transmission Line	Calling

Date	Species	Location	Notes
10/10/2006	Horned Larks	ALT - Segment 3 Transmission Line	Observed flying in Area
10/11/2006	Horned Larks	ALT - Segment 3 Transmission Line	Near Hercules Gap
10/11/2006	Horned Larks	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Horned Larks	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Magpie	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Magpies	ALT - Segment 3 Transmission Line	Observed in adjacent agricultural land
10/11/2006	Meadowlark	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Meadowlarks	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Mt. Bluebirds	ALT - Segment 3 Transmission Line	Observed to the NW beyond agricultural land
10/11/2006	Mt. Bluebirds	ALT - Segment 3 Transmission Line	Observed in Area
10/11/2006	Mt. Bluebirds	ALT - Segment 3 Transmission Line	On fence
10/11/2006	Mt. Bluebirds	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Mt. Bluebirds	ALT - Segment 3 Transmission Line	Observed in Area
10/11/2006	Mt. Bluebirds	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Northern Flicker	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Northern Flickers	ALT - Segment 3 Transmission Line	Near Archie Spring
10/11/2006	Raven	ALT - Segment 3 Transmission Line	Flying S
10/11/2006	Raven	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Raven	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Raven	ALT - Segment 3 Transmission Line	Observed
10/10/2006	Ravens	ALT - Segment 3 Transmission Line	Observed flying in Area
10/11/2006	Ravens	ALT - Segment 3 Transmission Line	Flying overhead
10/11/2006	Ravens	ALT - Segment 3 Transmission Line	Near Hercules Gap
10/11/2006	Ravens	ALT - Segment 3 Transmission Line	Near Archie Spring
10/11/2006	Rock Wren	ALT - Segment 3 Transmission Line	Calling on rocks N of Hercules Gap
10/11/2006	Rock Wren	ALT - Segment 3 Transmission Line	Near Hercules Gap
10/11/2006	Scrub Jay	ALT - Segment 3 Transmission Line	Calling by creek/drainage E of spring
10/11/2006	Scrub Jays	ALT - Segment 3 Transmission Line	Near Archie Spring
10/11/2006	Townsend's Solitaires	ALT - Segment 3 Transmission Line	Below source; In junipers
10/11/2006	Townsend's Solitaires	ALT - Segment 3 Transmission Line	Near Archie Spring

Date	Species	Location	Notes
10/10/2006	Western Meadowlark	ALT - Segment 3 Transmission Line	Observed in Area
10/11/2006	Western Meadowlark	ALT - Segment 3 Transmission Line	Observed in Area
10/10/2006	White-Crowned Sparrow	ALT - Segment 3 Transmission Line	Juvenile; In Sage
10/11/2006	White-Crowned Sparrow	ALT - Segment 3 Transmission Line	Observed in area
10/10/2006	White-Crowned Sparrows	ALT - Segment 3 Transmission Line	Observed flying in Area
10/11/2006	White-Crowned Sparrows	ALT - Segment 3 Transmission Line	Near Hercules Gap
10/11/2006	Yellow-Rumped Warblers	ALT - Segment 3 Transmission Line	Feeding on ground in Saltgrass and cow-pies with bluebirds
10/11/2006	Yellow-Rumped Warblers	ALT - Segment 3 Transmission Line	Observed in Area
6/26/2007	Barn Swallows	Duck Creek Water Supply Line	Overhead
11/17/2006	Bewick's Wren	Duck Creek Water Supply Line	In dense rabbitbrush
6/26/2007	Brewer's Blackbirds	Duck Creek Water Supply Line	Observed
6/27/2007	Brewer's Sparrow	Duck Creek Water Supply Line	In greasewood and Sage E of Duck Creek alkali meadow
6/26/2007	Brewer's Sparrow	Duck Creek Water Supply Line	Singing E of channel
11/16/2006	Bushtits	Duck Creek Water Supply Line	Observed
11/17/2006	Bushtits	Duck Creek Water Supply Line	Near excavated source
11/16/2006	California Quail	Duck Creek Water Supply Line	Observed
11/17/2006	California Quail	Duck Creek Water Supply Line	Flushed from dense veg N of wet
6/26/2007	Cliff Sparrows	Duck Creek Water Supply Line	Overhead
6/26/2007	Curlew	Duck Creek Water Supply Line	Chasing raven that was harassing
11/17/2006	Flicker	Duck Creek Water Supply Line	Overhead
11/16/2006	Great-tailed Grackle	Duck Creek Water Supply Line	In to utility pole
10/29/2006	Horned Lark	Duck Creek Water Supply Line	Calling in area
6/26/2007	Horned Lark	Duck Creek Water Supply Line	Lark off nest with 3 eggs
10/29/2006	Horned Larks	Duck Creek Water Supply Line	Observed in area
10/29/2006	Horned Larks	Duck Creek Water Supply Line	Observed overhead
10/29/2006	Horned Larks	Duck Creek Water Supply Line	Observed in area
11/16/2006	Horned Larks	Duck Creek Water Supply Line	Observed in area
6/27/2007	Horned Larks	Duck Creek Water Supply Line	Observed in area
11/17/2006	Juncos	Duck Creek Water Supply Line	In Russian Olive tree S of B-74
6/26/2007	Long-billed Curlews	Duck Creek Water Supply Line	Multiple observations. Flock of 23 in from N.

Date	Species	Location	Notes
11/17/2006	Northern Shrike	Duck Creek Water Supply Line	Juvenile; on wire to W
11/16/2006	Oregon Junco	Duck Creek Water Supply Line	In dense large Rubber Rabbitbrush and Basin Big Sage S of small pond
11/16/2006	Ravens	Duck Creek Water Supply Line	Flying overhead
11/16/2006	Ravens	Duck Creek Water Supply Line	Over area
6/26/2007	Ravens	Duck Creek Water Supply Line	Chasing curlew
6/26/2007	Ravens	Duck Creek Water Supply Line	Chasing each other
6/26/2007	Rough Winged Sparrows	Duck Creek Water Supply Line	Overhead
6/26/2007	Sage Thrashers	Duck Creek Water Supply Line	Singing in area
6/27/2007	Savanah Sparrow?	Duck Creek Water Supply Line	Possible Savanah Sparrow on E side of meadow in Basin Wildrye
11/17/2006	Song Sparrow	Duck Creek Water Supply Line	In rose patch N of B-180
6/26/2007	Song Sparrow	Duck Creek Water Supply Line	Common in Area
11/17/2006	White-Crowned Sparrows	Duck Creek Water Supply Line	In dense rabbitbrush N & E of ponds
10/16/2006	Horned Lark	North Plant Site	Heard calling in windmill area
11/7/2006	Horned Lark	North Plant Site	Flying overhead
10/16/2006	Horned Larks	North Plant Site	Observed on both sides of corridor
10/16/2006	Horned Larks	North Plant Site	In Area
10/16/2006	Horned Larks	North Plant Site	Flying Overhead
11/7/2006	Horned Larks	North Plant Site	Calling near tower
9/20/2006	Meadowlark	North Plant Site	Juveniles observed
9/20/2006	Raven	North Plant Site	Observed
10/16/2006	Raven	North Plant Site	Flying overhead
10/16/2006	Ravens	North Plant Site	Flying overhead windmill area; near E end of rail spur
10/16/2006	Ravens	North Plant Site	Flock flying overhead
9/20/2006	Sage Sparrow	North Plant Site	Observed
10/2/2006	Sparrow	North Plant Site	Observed
10/2/2006	Sparrow	North Plant Site	Observed
10/2/2006	Sparrow	North Plant Site	Observed
11/7/2006	Horned Lark	Alternative Rail Line/Lages Station Water pipeline: North	Flying overhead
11/9/2006	Horned Lark	Alternative Rail Line/Lages Station Water pipeline: North	Calling

Date	Species	Location	Notes
11/8/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	In Area
11/8/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Flying overhead
11/9/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Observed in area
11/9/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Flushed from sage
11/10/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Observed in Area
11/10/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Observed in Area
11/10/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Observed in Area
11/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	By fence corner and road junction
11/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	In area of road junction at E edge of new rail alignment
11/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Observed in Area
11/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Observed in Area
11/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Observed in area
11/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: North	Observed
11/7/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: North	Flying overhead
11/8/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: North	Flying overhead
11/9/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: North	Overhead
11/9/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: North	Over regularly
11/10/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: North	S of Windmill Area
11/10/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: North	Overhead
11/15/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: North	Observed
11/9/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: North	Observed in area
11/10/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: North	Overhead
11/10/2006	Shrike	Alternative Rail Line/Lages Station Water pipeline: North	S of Windmill Area
10/28/2006	Horned Lark	Alternative Rail Line/Lages Station Water pipeline: South	Flying overhead
10/28/2006	Horned Lark	Alternative Rail Line/Lages Station Water pipeline: South	Overhead and calling
10/28/2006	Horned Lark	Alternative Rail Line/Lages Station Water pipeline: South	Overhead
10/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	E of RR tracks; Not on route; Near Cherry Cr. Station
10/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Calling Overhead
10/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Passed over

Date	Species	Location	Notes
10/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	On return flight
10/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Overhead
10/15/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/16/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Observed in Schell Creek area
10/28/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Overhead S of Mattier Creek
10/28/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Overhead
10/30/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Overhead; Calling
10/30/2006	Horned Larks	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/16/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/28/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: South	Overhead and calling
10/28/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: South	Overhead and calling
10/30/2006	Raven	Alternative Rail Line/Lages Station Water pipeline: South	Raven Overhead
10/15/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: South	Calling in area
10/15/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/30/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: South	Overhead
10/30/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: South	Six to the S; Five to the W
10/30/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: South	Overhead
10/30/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: South	Overhead and calling
10/30/2006	Ravens	Alternative Rail Line/Lages Station Water pipeline: South	Overhead
10/15/2006	Sage Sparrows	Alternative Rail Line/Lages Station Water pipeline: South	By flow
10/15/2006	Sage Sparrows	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/15/2006	Sage Sparrows	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/30/2006	Shrike	Alternative Rail Line/Lages Station Water pipeline: South	On wire at Monte Neva Rd.
10/20/2006	Horned Larks	Alternative Rail Line: Alt 93 to I-80	Observed
11/3/2006	Horned Larks	Alternative Rail Line: Alt 93 to I-80	Observed
11/16/2006	Raven	Alternative Rail Line: Alt 93 to I-80	Observed
10/20/2006	Ravens	Alternative Rail Line: Alt 93 to I-80	Observed
11/3/2006	Ravens	Alternative Rail Line: Alt 93 to I-80	Observed
9/21/2006	Flicker	Rail Lead: North Plant Site	Observed
9/21/2006	Horned Lark	Rail Lead: North Plant Site	Observed

Date	Species	Location	Notes
10/16/2006	Horned Larks	Rail Lead: North Plant Site	Observed in area
9/21/2006	Magpies	Rail Lead: North Plant Site	Observed
9/21/2006	Magpies	Rail Lead: North Plant Site	Observed
9/21/2006	Meadowlark	Rail Lead: North Plant Site	Observed
9/21/2006	Mourning Dove	Rail Lead: North Plant Site	Observed
9/21/2006	Mt. Bluebirds	Rail Lead: North Plant Site	Observed
10/16/2006	Ravens	Rail Lead: North Plant Site	Over seasonal wet meadow
9/21/2006	Rock Wren	Rail Lead: North Plant Site	Observed
9/21/2006	Sage Sparrow	Rail Lead: North Plant Site	Observed
9/21/2006	Stellers Jay	Rail Lead: North Plant Site	Observed
10/9/2006	Bushtits	Robinson Summit Substation	In PJ
10/9/2006	Bushtits	Robinson Summit Substation	In Junipers with a few Pinyons mixed in
10/9/2006	Bushtits	Robinson Summit Substation	Observed
10/9/2006	Bushtits	Robinson Summit Substation	In Junipers and Rabbitbrush W of outcrop
10/9/2006	Bushtits	Robinson Summit Substation	
10/9/2006	Flicker	Robinson Summit Substation	Calling to the N
10/9/2006	Flickers	Robinson Summit Substation	Observed in area
10/9/2006	Flickers	Robinson Summit Substation	Flushed from outcrop
10/9/2006	House Finches	Robinson Summit Substation	NW of site
10/9/2006	House Finches	Robinson Summit Substation	
10/9/2006	Juncos	Robinson Summit Substation	
10/9/2006	Mt. Bluebird	Robinson Summit Substation	Male; In Junipers
10/9/2006	Mt. Bluebird	Robinson Summit Substation	Male; Observed to the N
10/9/2006	Mt. Bluebirds	Robinson Summit Substation	One male; One female
10/9/2006	Mt. Bluebirds	Robinson Summit Substation	
10/9/2006	Mt. Chickadee	Robinson Summit Substation	Observed
10/9/2006	Mt. Chickadees	Robinson Summit Substation	In dense PJ line to NW
10/9/2006	Mt. Chickadees	Robinson Summit Substation	In Junipers and Rabbitbrush W of outcrop
10/9/2006	Mt. Chickadees	Robinson Summit Substation	
10/9/2006	Northern Flicker	Robinson Summit Substation	

Date	Species	Location	Notes
10/9/2006	Oregon Junco	Robinson Summit Substation	Observed
10/9/2006	Phoebe	Robinson Summit Substation	Birds observed in Pinyon to E
10/9/2006	Raven	Robinson Summit Substation	Calling
10/9/2006	Raven	Robinson Summit Substation	
10/9/2006	White-Crowned Sparrows	Robinson Summit Substation	
6/28/2007	Barn Swallows	Segment 6C Transmission Line	Ellison Cr.
6/29/2007	Horned Larks	Segment 6C Transmission Line	Observed S of Kirch WMA
6/29/2007	Long-billed Curlew	Segment 6C Transmission Line	Observed S of Kirch WMA
6/29/2007	Mockingbird	Segment 6C Transmission Line	Observed S of Kirch WMA
6/28/2007	Mt. Blubirds	Segment 6C Transmission Line	Upper White River
6/28/2007	Raven	Segment 6C Transmission Line	Ellison Cr.
6/29/2007	Raven	Segment 6C Transmission Line	Observed overhead S of Kirch WMA
6/28/2007	Sage Sparrows	Segment 6C Transmission Line	Lower S fork of Ellison Cr.
6/28/2007	Spotted Towhee	Segment 6C Transmission Line	Upper White River
6/28/2007	Spotted Towhee	Segment 6C Transmission Line	Upper White River
6/29/2007	Western Meadowlarks	Segment 6C Transmission Line	Observed S of Kirch WMA
6/29/2007	Yellow-headed Blackbirds	Segment 6C Transmission Line	Observed S of Kirch WMA
9/19/2006	Horned Lark	South Plant Site	Observed
9/19/2006	Killdeer	South Plant Site	Observed
9/19/2006	Meadowlark	South Plant Site	Observed
9/19/2006	Ravens	South Plant Site	Observed
TEPCS AVIAN			
11/16/2006	Loggerhead Shrike	ALT - Segment 10 Transmission Line	Gregorsian Basin; NW corner
11/16/2006	Loggerhead Shrike	ALT - Segment 10 Transmission Line	Gregorsian Basin; NW corner
10/11/2006	Pinyon Jays	ALT - Segment 3 Transmission Line	Calling in area
10/11/2006	Pinyon Jays	ALT - Segment 3 Transmission Line	In lower Lucetti Canyon
10/10/2006	Sandhill Cranes	ALT - Segment 3 Transmission Line	High overhead; Flying S; Calling, Descending
10/10/2006	Sandhill Cranes	ALT - Segment 3 Transmission Line	Observed flying in Area
6/27/2007	Loggerhead Shrike	Duck Creek Water Supply Line	In greasewood and ARNO; 1mile E of alkali meadow
11/16/2006	Pinyon Jays	Duck Creek Water Supply Line	Flying N overhead; Calling a little

Date	Species	Location	Notes
11/17/2006	Pinyon Jays	Duck Creek Water Supply Line	Flew W, then back E; Calling to E
10/28/2006	*Sage Grouse	Alternative Rail Line/Lages Station Water pipeline: South	Summer group; 20 pellets
10/9/2006	*Sage Grouse	Robinson Summit Substation	Winter Group; 60+ pellets
10/9/2006	*Sage Grouse	Robinson Summit Substation	Two old tar patches in two-track; W edge of RSS Boundary
10/9/2006	Pinyon Jays	Robinson Summit Substation	Calling
10/26/2006	Pinyon Jay	Segment 4A Transmission Line	Overhead; Calling
10/26/2006	Pinyon Jays	Segment 4A Transmission Line	Calling from PJ slopes S of Smith Valley
TEPCS RAPTORS			
11/0/2006	Burrowing Owl	ALT - Segment 10 Transmission Line	N end of Kane Springs Valley; Flew out of den
11/16/2006	Golden Eagle	ALT - Segment 10 Transmission Line	Delmar NW; All on power line coming into corridor
10/10/2006	Ferruginous Hawk	ALT - Segment 3 Transmission Line	Flushed off fence several posts E of gate
10/10/2006	Ferruginous Hawk	ALT - Segment 3 Transmission Line	Observed flying in Area
10/10/2006	Golden Eagle	ALT - Segment 3 Transmission Line	S Steptoe Site to Basset Lake
10/11/2006	Golden Eagle	ALT - Segment 3 Transmission Line	Ryan observed over Hercules Gap; Flying N
10/11/2006	Golden eagle	ALT - Segment 3 Transmission Line	Near Hercules Gap
10/12/2006	Golden Eagle	ALT - Segment 3 Transmission Line	On power pole; E side of road
11/16/2006	Golden Eagle	Duck Creek Water Supply Line	Adult; Flying overhead; N of W from hills to E
6/26/2007	Prairie Falcon	Duck Creek Water Supply Line	On ground by small pond
11/16/2006	Short Eared Owl	Duck Creek Water Supply Line	Male; flying to N
11/15/2006	Ferruginous Hawk	Alternative Rail Line/Lages Station Water pipeline: North	By fence corner and road junction
11/9/2006	Golden Eagle	Alternative Rail Line/Lages Station Water pipeline: North	Sub-adult; Much white on tail and wings; Flying SE
11/8/2006	Prairie Falcon	Alternative Rail Line/Lages Station Water pipeline: North	Hwy 93; Flushed from power line
11/7/2006	Short Eared Owl	Alternative Rail Line/Lages Station Water pipeline: North	Flushed by Ryan earlier
11/10/2006	Unidentified Burrows	Alternative Rail Line/Lages Station Water pipeline: North	Several burrows in area; Could be burrowing owl sites
10/30/2006	Ferruginous Hawk	Alternative Rail Line/Lages Station Water pipeline: South	1/2 mi S of GPS 85
10/30/2006	Prairie Falcon	Alternative Rail Line/Lages Station Water pipeline: South	On top of dirt pile 150 yards W of GPS 44
10/20/2006	Golden Eagle	Alternative Rail Line: Alt 93 to I-80	Observed
10/26/2006	Ferruginous Hawk	Segment 4A Transmission Line	Perched on pole on S Transmission line 2 strs E of road up onto higher ground
10/4/2006	Burrowing Owl	South Plant Site	Observed; GPS locations taken

Date	Species	Location	Notes
9/19/2006	Prairie Falcon	South Plant Site	Observed
PREDATORY MAMMALS			
10/4/2006	Badger	South Plant Site	Observed
6/26/2007	Coyote	Duck Creek Water Supply Line	Calling E of N (lower) end of corridor
10/16/2006	Coyote	North Plant Site	100 yds up stream
11/7/2006	Coyote	Alternative Rail Line/Lages Station Water pipeline: North	Observed to North; Reddish coat
10/16/2006	Coyote	Alternative Rail Line/Lages Station Water pipeline: South	Observed
11/16/2006	Coyote	Alternative Rail Line: Alt 93 to I-87	Observed
6/25/2007	Coyote	South Plant Site	Off E of B-1 - B-31 wetland area
11/8/2006	Coyotes	Alternative Rail Line/Lages Station Water pipeline: North	Chorus off to S of W
10/11/2006	Kit Fox	ALT - Segment 3 Transmission Line	Observed at active den (GPS taken)
10/9/2006	Red Fox	Robinson Summit Substation	Observed in Drainage
BIG GAME			
6/29/2007	Pronghorn	ALT - Segment 10 Transmission Line	S of Kirch WMA
6/26/2007	Pronghorn	ALT - Segment 1A Transmission Line	10 Doe, 2 Bucks, 3 Kids, N through Duck Creek Meadow at Segment 1A
6/28/2007	Pronghorn	ALT - Segment 1A Transmission Line	4 Doe N of Duck Creek Road, below Gap
10/11/2006	Bighorn	ALT - Segment 3 Transmission Line	2 Rams; At Hercules gap
10/10/2006	Mule Deer	ALT - Segment 3 Transmission Line	4 does at point where Basset Lake Dam rd hits along E side of lake
10/10/2006	Mule Deer	ALT - Segment 3 Transmission Line	1 spike buck at point where Basset Lake Dam rd hits along E side of lake
10/10/2006	Mule Deer	ALT - Segment 3 Transmission Line	3 fawns at point where Basset Lake Dam rd hits along E side of lake
10/10/2006	Mule Deer	ALT - Segment 3 Transmission Line	4 Does; 1 Spike Buck; 3 Yearlings; Near Basset Lake
10/10/2006	Mule Deer	ALT - Segment 3 Transmission Line	S Steptoe Site to Basset Lake
10/11/2006	Pronghorn	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Pronghorn	ALT - Segment 3 Transmission Line	Observed
10/29/2006	Pronghorn	Duck Creek Water Supply Line	Observed near S edge of S water line corridor
11/16/2006	Pronghorn	Duck Creek Water Supply Line	Close to road ENE of windmill
11/16/2006	Pronghorn	Duck Creek Water Supply Line	ESE and E of S site windmill
11/16/2006	Pronghorn	Duck Creek Water Supply Line	N of E of S Plant site windmill
10/16/2006	Pronghorn	North Plant Site	1/4 mi up stream; Likely same group observed 10/15/06

Date	Species	Location	Notes
11/8/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	SE & E of South Plant; Same herd as observed 11/7/2006
11/9/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	W of road; 3 mi S of Schellborne Station
11/9/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	W of road near windmill on S plant site
11/10/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	S of fence, Open area, S Plant Area W of windmill,
11/10/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	N of fence, NE and ENE of windmill in S Plant Area
11/10/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	E of S Site Windmill
11/15/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	Two groups (10 & 6) N of fence, NE of windmill on S Plant site
11/15/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	S of fence, S of windmill, S Plant site
11/15/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	S of road into windmill on S Slant site
11/15/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	N of road into windmill on S Plant site
10/15/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	1 Buck; at least 17 Does; 1/4 mi N of windmill
10/15/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	W of Hwy 93 in corridor; 4 mi S of Schellborne Station
10/16/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	S of Schell Creek
10/28/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	W of Hwy 93; 1 mi N of Duck Creek Rd.
10/30/2006	Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	Observed in S Plant Site; Between Hwy 93 and windmill
10/20/2006	Pronghorn	Alternative Rail Line: Alt 93 to I-82	3 Does and 1 Buck
11/3/2006	Pronghorn	Alternative Rail Line: Alt 93 to I-85	Observed
9/21/2006	Pronghorn	Robinson Summit Substation	Observed
10/4/2006	Pronghorn	South Plant Site	Observed
10/4/2006	Pronghorn	South Plant Site	Observed
10/29/2006	Pronghorn	South Plant Site	W of Hwy 93; E of windmill on S plant site
10/29/2006	Pronghorn	South Plant Site	Observed 1 mi W and NW of RF-43 and N of windmill
6/25/2007	Pronghorn	South Plant Site	2 Doe and 1 Kid; 1/2 mile N of S fence
6/25/2007	Pronghorn	South Plant Site	2 Doe S of S fence
6/25/2007	Pronghorn	South Plant Site	4 Doe and 1 Kid N of RF-14
SMALL MAMMALS			
11/16/2006	White-Tailed Antelope Squirrel	ALT - Segment 10 Transmission Line	Delmar NW
11/16/2006	Black-tailed Jack Rabbit	ALT - Segment 10 Transmission Line	Gregorsian Basin; NW corner
6/29/2007	Black-tailed Jack Rabbits	ALT - Segment 10 Transmission Line	In corridor; S of Kirch WMA
6/29/2007	Black-tailed Jack Rabbits	ALT - Segment 1A Transmission Line	Observed

Date	Species	Location	Notes
10/10/2006	White-Tailed Antelope Squirrel	ALT - Segment 3 Transmission Line	S Steptoe Site to Basset Lake
10/11/2006	White-Tailed Antelope Squirrel	ALT - Segment 3 Transmission Line	Observed
10/10/2006	Black-tailed Jack Rabbit	ALT - Segment 3 Transmission Line	Flushed
10/10/2006	Black-tailed Jack Rabbit	ALT - Segment 3 Transmission Line	S Steptoe Site to Basset Lake
10/11/2006	Black-tailed Jack Rabbit	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Black-tailed Jack Rabbit	ALT - Segment 3 Transmission Line	Observed
10/10/2006	Black-tailed Jack Rabbits	ALT - Segment 3 Transmission Line	Observed in Area
10/12/2006	Black-tailed Jack Rabbits	ALT - Segment 3 Transmission Line	Numerous in area
10/11/2006	Cottontail Rabbit	ALT - Segment 3 Transmission Line	Observed
10/11/2006	Least Chipmunk	ALT - Segment 3 Transmission Line	Observed along Railroad
10/29/2006	Black-tailed Jack Rabbit	Duck Creek Water Supply Line	Flushed
11/16/2006	Black-tailed Jack Rabbit	Duck Creek Water Supply Line	Flushed in swale
11/16/2006	Black-tailed Jack Rabbit	Duck Creek Water Supply Line	Flushed
11/17/2006	Black-tailed Jack Rabbit	Duck Creek Water Supply Line	Flushed
11/16/2006	Black-tailed Jack Rabbits	Duck Creek Water Supply Line	Throughout area
6/27/2007	Black-tailed Jack Rabbits	Duck Creek Water Supply Line	In greasewood and ARWY E of alkali meadow
11/16/2006	Cottontail Rabbit	Duck Creek Water Supply Line	Observed
11/16/2006	Cottontail Rabbit	Duck Creek Water Supply Line	Observed at DC7
11/17/2006	Cottontail Rabbit	Duck Creek Water Supply Line	Observed
11/17/2006	Cottontail Rabbit	Duck Creek Water Supply Line	Flushed
11/17/2006	Cottontail Rabbits	Duck Creek Water Supply Line	Observed
10/29/2006	Least Chipmunk	Duck Creek Water Supply Line	Observed in ARWY bordering drainage
10/29/2006	Least Chipmunk	Duck Creek Water Supply Line	Observed in ARNO/Green Rabbitbrush bordering drain
11/16/2006	Unknown Rodents	Duck Creek Water Supply Line	Observed
9/20/2006	Black-tailed Jack Rabbit	North Plant Site	Observed
9/20/2006	Black-tailed Jack Rabbit	North Plant Site	Observed
10/16/2006	Black-tailed Jack Rabbit	North Plant Site	Flushed
11/7/2006	Black-tailed Jack Rabbit	North Plant Site	Observed
10/16/2006	Least Chipmunk	North Plant Site	N of drainage
10/16/2006	Rodents	North Plant Site	Rodent activity in and near site

Date	Species	Location	Notes
9/20/2006	Unknown Chipmunk	North Plant Site	Observed
11/7/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Flushed
11/8/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Flushed
11/8/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Observed
11/8/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Off to the N
11/9/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Observed in area
11/15/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	In ARWY
11/15/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Flushed
11/8/2006	Chipmunk	Alternative Rail Line/Lages Station Water pipeline: North	Observed
11/8/2006	Least Chipmunk	Alternative Rail Line/Lages Station Water pipeline: North	Observed
11/15/2006	Least Chipmunk	Alternative Rail Line/Lages Station Water pipeline: North	By ARWY swale
10/28/2006	Antelope Ground Squirrel	Alternative Rail Line/Lages Station Water pipeline: South	Near Hwy 93
10/15/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/15/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/16/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/28/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed
10/28/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed
10/28/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/28/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed to the E
10/30/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed
10/30/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed
10/30/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Observed in area
11/15/2006	Black-tailed Jack Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/30/2006	Chipmunk	Alternative Rail Line/Lages Station Water pipeline: South	Observed in area
10/16/2006	Least Chipmunk	Alternative Rail Line/Lages Station Water pipeline: South	Observed
10/28/2006	Least Chipmunk	Alternative Rail Line/Lages Station Water pipeline: South	Near Hwy 93
10/20/2006	Black-tailed Jack Rabbit	Alternative Rail Line: Alt 93 to I-80	Observed
10/20/2006	Least Chipmunk	Alternative Rail Line: Alt 93 to I-81	Observed
11/2/2006	Black-tailed Jack Rabbit	Alternative Rail Line: Alt 93 to I-83	Observed
11/3/2006	Black-tailed Jack Rabbit	Alternative Rail Line: Alt 93 to I-84	Observed

Date	Species	Location	Notes
11/16/2006	Black-tailed Jack Rabbit	Alternative Rail Line: Alt 93 to I-86	Observed
9/21/2006	Black-tailed Jack Rabbit	Robinson Summit Substation	Observed
10/9/2006	Black-tailed Jack Rabbit	Robinson Summit Substation	Observed S of drain 2
10/9/2006	Black-tailed Jack Rabbits	Robinson Summit Substation	Observed
10/9/2006	Cottontail Rabbit	Robinson Summit Substation	Flushed just E of area; From rocky spot on slope
10/9/2006	Cottontail Rabbit	Robinson Summit Substation	Observed at top of E hill
10/9/2006	Cottontail Rabbits	Robinson Summit Substation	Flushed from just S of outcrop
10/9/2006	Cottontail Rabbits	Robinson Summit Substation	Observed
10/9/2006	Ground Squirrel	Robinson Summit Substation	Observed
10/9/2006	Least Chipmunk	Robinson Summit Substation	On rock
10/9/2006	Least Chipmunk	Robinson Summit Substation	Observed
9/19/2006	Black-tailed Jack Rabbit	South Plant Site	Observed
10/4/2006	Black-tailed Jack Rabbit	South Plant Site	Observed
10/4/2006	Black-tailed Jack Rabbit	South Plant Site	Observed
9/19/2006	Ground Squirrel	South Plant Site	Observed
6/25/2007	Least Chipmunks	South Plant Site	Observed in Area
AMPHIBIANS & REPTILES			
11/8/2006	Tortoise	ALT - Segment 10 Transmission Line	
11/9/2006	Tortoise	ALT - Segment 10 Transmission Line	
11/9/2006	Side Blotched Lizard	ALT - Segment 10 Transmission Line	Pahranagat Wash; Near isolated hill
11/16/2006	Side Blotched Lizard	ALT - Segment 10 Transmission Line	Gregorsian Basin; NW corner
11/8/2006	Sidewinder	ALT - Segment 10 Transmission Line	S half of Kane Springs Valley
11/9/2006	Tortoise	ALT - Segment 10 Transmission Line	Deceased Tortoise; Pahranagat Wash; Near isolated hill
10/11/2006	Side Blotched Lizard	ALT - Segment 3 Transmission Line	Observed
11/17/2006	Frogs	Duck Creek Water Supply Line	Unidentified frogs in culvert
11/16/2006	Snake Skin	Duck Creek Water Supply Line	Unknown
9/20/2006	Horned Lizard	North Plant Site	Observed
10/16/2006	Sagebrush Lizard	North Plant Site	3" Sagebrush lizard by drainage
9/20/2006	Side Blotched Lizard	North Plant Site	Observed
11/10/2006	Sagebrush Lizard	Alternative Rail Line/Lages Station Water pipeline: North	2" Lizard; still active for late in the year

Date	Species	Location	Notes
10/15/2006	Sagebrush Lizard	Alternative Rail Line/Lages Station Water pipeline: South	5" long
10/15/2006	Sagebrush Lizard	Alternative Rail Line/Lages Station Water pipeline: South	Several 2" long
10/16/2006	Sagebrush Lizard	Alternative Rail Line/Lages Station Water pipeline: South	Observed N Cherry Creek Road
10/15/2006	Sagebrush Lizards	Alternative Rail Line/Lages Station Water pipeline: South	Observed; Some 2" long
10/14/2006	Terrestrial Garter Snake	Alternative Rail Line/Lages Station Water pipeline: South	Observed in middle canyon
10/12/2006	Side Blotched Lizard	Alternative Rail Line/Lages Station Water pipeline: South	Area S of N Plant Site (Egan Cr. Egan Basin. Butte Valley)
11/3/2006	Unknown Lizard	Alternative Rail Line: Alt 93 to I-80	Unknown lizard
10/9/2006	Lizard	Robinson Summit Substation	Observed 10' to the E of burrow
10/9/2006	Unknown Lizard	Robinson Summit Substation	2" unknown lizard
10/9/2006	Unknown Snake	Robinson Summit Substation	Blunt tail; Grey with black markings; Yellow eyes; Black stripe behind eye (photo 3262 & 3263)
6/28/2007	Leopard lizard	Segment 6C Transmission Line	Upper White River
6/28/2007	Sagebrush Lizards	Segment 6C Transmission Line	By Ellison Cr.
9/19/2006	Unknown Lizard	South Plant Site	Smaller than Side-blotched Lizards
WATERFOWL			
10/11/2006	American Pipets	ALT - Segment 3 Transmission Line	In pond
10/11/2006	American Pipets	ALT - Segment 3 Transmission Line	Observed in Area
10/11/2006	American Wigeon	ALT - Segment 3 Transmission Line	On pond NE of SS-9
10/11/2006	American Wigeon	ALT - Segment 3 Transmission Line	On Pond
10/10/2006	Canada Geese	ALT - Segment 3 Transmission Line	Basset Lake
10/12/2006	Canada Geese	ALT - Segment 3 Transmission Line	Overhead
10/10/2006	Coots	ALT - Segment 3 Transmission Line	Coots in Basset Lake
10/10/2006	Coots	ALT - Segment 3 Transmission Line	On Basset Lake
10/10/2006	Coots	ALT - Segment 3 Transmission Line	Basset Lake
10/10/2006	Gadwall	ALT - Segment 3 Transmission Line	Basset Lake
10/11/2006	Green-Winged Teal	ALT - Segment 3 Transmission Line	On pond NE of SS-9
10/11/2006	Green-Winged Teal	ALT - Segment 3 Transmission Line	Into pond then off to S
10/11/2006	Green-Winged Teal	ALT - Segment 3 Transmission Line	On Pond
10/10/2006	Lesser Scaups	ALT - Segment 3 Transmission Line	Scaups on Basset Lake
10/10/2006	Lesser Scaups	ALT - Segment 3 Transmission Line	On Basset Lake

Date	Species	Location	Notes
10/10/2006	Mallard	ALT - Segment 3 Transmission Line	Basset Lake
10/11/2006	Mallard	ALT - Segment 3 Transmission Line	Female; Upstream; Flying low to the N
10/10/2006	Mallards	ALT - Segment 3 Transmission Line	Mallards in Basset Lake
10/10/2006	Mallards	ALT - Segment 3 Transmission Line	On Basset Lake
10/11/2006	Mallards	ALT - Segment 3 Transmission Line	On pond NE of SS-9
10/11/2006	Mallards	ALT - Segment 3 Transmission Line	On Pond
11/17/2006	American Pipet	Duck Creek Water Supply Line	Calling in field
11/16/2006	Great Blue Herons	Duck Creek Water Supply Line	Flying S up valley and over dam/reservoir
11/16/2006	Green-Winged Teal	Duck Creek Water Supply Line	Flushed from pond
11/16/2006	Lesser Scaup	Duck Creek Water Supply Line	Female; on pond behind dam
11/16/2006	Mallard	Duck Creek Water Supply Line	Quacking to the SW
11/17/2006	Mallard	Duck Creek Water Supply Line	Quacking upstream
11/16/2006	Mallards	Duck Creek Water Supply Line	Males; Flushed from pond
11/16/2006	Snipes	Duck Creek Water Supply Line	flushed from creek
11/16/2006	Snipes	Duck Creek Water Supply Line	flushed from creek
PYGMY RABBIT SIGN			
10/10/2006	*Pygmy Rabbit	ALT - Segment 3 Transmission Line	Burrows throughout ARTR
10/29/2006	*Pygmy Rabbit	Duck Creek Water Supply Line	Burrow under sage just N of channel
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Active burrow in moderate density 2' sage
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Burrow under ARWY near open patches
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Burrows in incised banks
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Burrow under ARWY
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Active burrow
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Active burrow
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Active burrow N of S-most braid of Second Creek.
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Fresh burrow
11/9/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Complex of 6 burrows in and under ARWY
11/10/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Burrow on W edge of ARWY
10/16/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow with old Pygmy rabbit Pellets
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Pellets

Date	Species	Location	Notes
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow and pellets just S of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow with fresh pellets S of drainage in 1-2' mod density ARWY
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow and fresh pellets in N bank
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Older burrow just S of channel; photo 3612
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow complex in ARWY bordering drainage; 4 entrances
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	2 burrows; One under greasewood; Partial burrow under ARWY
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow under ARWY
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Two older burrows and one fresh burrow to N
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	burrows in upper extent of greasewood; fresh green pellets
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Two older burrows under ARWY just N of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Two burrows in N side/edge of incised channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow in S bank
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow near top of N bank
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow in S bank
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow in S bank and pellets
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow in N bank
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Fresh burrow in 5' X 7' open spot just S of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow; 10' N
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow on S bank
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow 8' N of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	More "classical" Pygmy Rabbit habitat
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow in dense sage S of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow N of channel and Second Elderberry
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow just S of channel & just inside E edge of water line corridor
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow N of channel & 70' W of ROW fence.
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Old burrow N of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrows on either side of RF-74 & one in bottom of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow N of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow N of channel

Date	Species	Location	Notes
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow N of channel
10/28/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow 25' N of channel
10/30/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Complex of three burrows in ARNO
10/30/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow complex in highway
10/30/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Four burrows under ARWY in N diversion channel of Mattier Cr.
10/30/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Pellets in ARNO; E of fence line road
10/30/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow
10/30/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow with fresh pellets; S of drainage
10/30/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow
10/30/2006	*Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Burrow
11/3/2006	*Pygmy Rabbit	Alternative Rail Line: Alt 93 to I-80	Burrows in area
11/16/2006	*Pygmy Rabbit	Alternative Rail Line: Alt 93 to I-80	Two active burrows with droppings
6/27/2007	*Pygmy Rabbit	Segment 1A Transmission Line	Burrow
10/10/2006	*Pygmy Rabbit	ALT - Segment 3 Transmission Line	Possible old Pygmy burrow; Open; Under Sage; No Pellets;
10/10/2006	*Pygmy Rabbit	ALT - Segment 3 Transmission Line	Concentration of six burrows
10/10/2006	*Pygmy Rabbit	ALT - Segment 3 Transmission Line	Pygmy Burrow; Fresh Pellets
10/10/2006	*Pygmy Rabbit	ALT - Segment 3 Transmission Line	Several Pygmy burrows and pellets S of creek
10/10/2006	*Pygmy Rabbit	ALT - Segment 3 Transmission Line	Pygmy pellets S of drainage/creek
10/10/2006	*Pygmy Rabbit	ALT - Segment 3 Transmission Line	Pygmy Rabbit burrows; Open; Older pellets; In sage N of drainage
PYGMY RABBIT OBSERVATIONS			
6/27/2007	Pygmy Rabbit	ALT - Segment 1A Transmission Line	Pygmy Rabbits Observed
10/11/2006	Pygmy Rabbit	ALT - Segment 3 Transmission Line	Observed
10/12/2006	Pygmy Rabbit	ALT - Segment 3 Transmission Line	Observed along Steptoe creek; Just N of Falcon-Gonder Intersection
10/10/2006	Pygmy Rabbit	ALT - Segment 3 Transmission Line	Observed near Basset Lake
10/10/2006	Pygmy Rabbit	ALT - Segment 3 Transmission Line	Observed S Steptoe Site to Basset Lake
11/7/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Observed across Road E. of line
11/7/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Observed where road turns into BLM; South of private
11/9/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Observed
11/9/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: North	Observed

Date	Species	Location	Notes
10/28/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed
10/28/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed S of channel
10/28/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed 60 ft to the NE of RF-71
10/30/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Observed in drainage
10/30/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed out of mod density ARNO
10/30/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Flushed just N of drainage
10/30/2006	Pygmy Rabbit	Alternative Rail Line/Lages Station Water pipeline: South	Observed by Jackee N of stock pond
11/16/2006	Pygmy Rabbit	Alternative Rail Line: Alt 93 to I-80	Observed
6/28/2007	Pygmy Rabbit	Segment 6C Transmission Line	Possible burrow; Near N fork of Ellison Cr.
WILDLIFE SIGN			
10/10/2006	*Elk	ALT - Segment 3 Transmission Line	Pellets along segment SW of S Plant & NE of Duck Cr. Crossing
10/11/2006	*Elk	ALT - Segment 3 Transmission Line	Pellets
10/11/2006	*Elk	ALT - Segment 3 Transmission Line	Pellets; Below spring
10/11/2006	*Elk	ALT - Segment 3 Transmission Line	Pellets in middle Lucetti Canyon
10/11/2006	*Mule Deer	ALT - Segment 3 Transmission Line	Pellets in middle Lucetti Canyon
10/11/2006	*Mule Deer	ALT - Segment 3 Transmission Line	Fresh deer tracks near Archie Spring
10/11/2006	*Mule Deer	ALT - Segment 3 Transmission Line	Pellets
10/11/2006	*Mule Deer	ALT - Segment 3 Transmission Line	Tracks in area
10/10/2006	*Pronghorn	ALT - Segment 3 Transmission Line	Pellets along segment SW of S Plant & NE of Duck Cr. Crossing
10/11/2006	*Ungulate Trail	ALT - Segment 3 Transmission Line	Deer and Elk trail across creek just below confluence
11/17/2006	*2 Unidentified nests	Duck Creek Water Supply Line	In Willows N of N Channel
11/16/2006	*Burrowing Owl	Duck Creek Water Supply Line	Relic burrows; Suitable veg community for burrowing owls
10/29/2006	*Canid Burrows	Duck Creek Water Supply Line	Canid burrows in bank
11/16/2006	*Coyote	Duck Creek Water Supply Line	Tracks
11/16/2006	*Coyote	Duck Creek Water Supply Line	Scat
10/29/2006	*Elk	Duck Creek Water Supply Line	Older pellets in ditch
11/17/2006	*Elk	Duck Creek Water Supply Line	Pellets in fields on both sides of road
11/17/2006	*Magpie	Duck Creek Water Supply Line	In shrubs near cabin
11/17/2006	*Mountain Lion	Duck Creek Water Supply Line	Tracks
11/16/2006	*Mule Deer	Duck Creek Water Supply Line	Tracks

Date	Species	Location	Notes
11/16/2006	*Mule Deer	Duck Creek Water Supply Line	Tracks in area
11/17/2006	*Mule Deer	Duck Creek Water Supply Line	Pellets in fields on both sides of road
10/29/2006	*Pronghorn	Duck Creek Water Supply Line	Pellets in area
11/16/2006	*Pronghorn	Duck Creek Water Supply Line	Tracks in larger swale
11/16/2006	*Pronghorn	Duck Creek Water Supply Line	Pellets in area
9/20/2006	*Badger	North Plant Site	Burrow
10/3/2006	*Black Tailed Jack Rabbit	North Plant Site	Pellets
9/20/2006	*Coyote	North Plant Site	Coyote scat
10/3/2006	*Coyote	North Plant Site	Coyote scat
9/20/2006	*Fox	North Plant Site	Fox den
9/20/2006	*Fur	North Plant Site	Unidentified fur collected
9/20/2006	*Pronghorn	North Plant Site	Pronghorn pellets
11/7/2006	*Coyote	Alternative Rail Line/Lages Station Water pipeline: North	Tracks in Area
11/8/2006	*Coyote	Alternative Rail Line/Lages Station Water pipeline: North	Den back in dunes: Tracks and scat
11/8/2006	*Elk	Alternative Rail Line/Lages Station Water pipeline: North	Pellets
11/10/2006	*Elk	Alternative Rail Line/Lages Station Water pipeline: North	Tracks running ENE
11/9/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	Active trail
11/9/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	Trail just S of road and just inside corridor
11/10/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	Tracks in area
11/10/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	Older pellets in area of "Y" where line splits
11/15/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: North	Pellets in area
10/16/2006	*Coyote	Alternative Rail Line/Lages Station Water pipeline: South	Large, fresh tracks in channel
10/28/2006	*Coyote	Alternative Rail Line/Lages Station Water pipeline: South	Tracks in area
10/28/2006	*Coyote	Alternative Rail Line/Lages Station Water pipeline: South	Tracks in area
10/30/2006	*Coyote	Alternative Rail Line/Lages Station Water pipeline: South	Scat in area
10/28/2006	*Kit fox	Alternative Rail Line/Lages Station Water pipeline: South	Burrow
11/15/2006	*Predator Burrows	Alternative Rail Line/Lages Station Water pipeline: South	Burrows with kit fox and coyote tracks
10/16/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	Droppings on E side of corridor
10/16/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	Pellets
10/16/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	Fresh pellets

Date	Species	Location	Notes
10/16/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	Fresh tracks across channel
10/30/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	Older pellets in area
10/30/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	Fresh tracks, pellets, and urine; Near borrow pit piles
10/30/2006	*Pronghorn	Alternative Rail Line/Lages Station Water pipeline: South	Fresh antelope tracks
11/15/2006	*Raptor Habitat	Alternative Rail Line/Lages Station Water pipeline: South	Whitewash; Nests; Along cliffs of Dolly Varden to Mizpah Point
10/20/2006	*Coyote	Alternative Rail Line: Alt 93 to I-80	Scat
11/2/2006	*Coyote	Alternative Rail Line: Alt 93 to I-80	Scat in area
11/3/2006	*Coyote	Alternative Rail Line: Alt 93 to I-80	Tracks
10/20/2006	*Pronghorn	Alternative Rail Line: Alt 93 to I-80	Tracks
10/9/2006	*Black Tailed Jack Rabbit	Robinson Summit Substation	Pellets
10/10/2006	*Black Tailed Jack Rabbit	Robinson Summit Substation	Droppings
10/9/2006	*Canid Burrows	Robinson Summit Substation	Observed
10/9/2006	*Cottontail	Robinson Summit Substation	Pellets
10/9/2006	*Coyote	Robinson Summit Substation	Coyote scat in sage
10/9/2006	*Coyote	Robinson Summit Substation	Coyote scat in sage
10/9/2006	*Coyote	Robinson Summit Substation	'racks in drain & road S of main E-W drain
10/9/2006	*Elk	Robinson Summit Substation	Pellets; Near E end of S Power Line
10/9/2006	*Elk	Robinson Summit Substation	Pellets
10/9/2006	*Elk	Robinson Summit Substation	Pellets
10/10/2006	*Feral Horse	Robinson Summit Substation	Droppings
10/9/2006	*Mule Deer	Robinson Summit Substation	Pellets
10/9/2006	*Mule Deer	Robinson Summit Substation	Pellets
10/9/2006	*Packrat	Robinson Summit Substation	Nest; Shallow Crevice; Whitewash;
10/9/2006	*Packrat or Prairie Falcon	Robinson Summit Substation	Nest; Whitewash & Crevice
10/9/2006	*Prairie Falcon	Robinson Summit Substation	Unconfirmed Falcon nest (photo 3260 & 3261)
10/9/2006	*Predator Burrow	Robinson Summit Substation	Coyote Den; 12" diameter; Pic 6
10/9/2006	*Predator Burrow	Robinson Summit Substation	Predator Burrow
10/10/2006	*Predator Burrow	Robinson Summit Substation	Large and active Burrow; photographed
10/9/2006	*Rodent Burrows	Robinson Summit Substation	Observed
10/9/2006	*Unidentified Burrow	Robinson Summit Substation	Active burrow at base of N face

Date	Species	Location	Notes
6/28/2007	*Coyote	Segment 1A Transmission Line	Tracks
10/15/2006	*Coyote	Segment 1B Transmission Line	Group howling to the NE
10/14/2006	*Mule Deer	Segment 1B Transmission Line	Tracks Along Creek
10/15/2006	*Packrat	Segment 1B Transmission Line	Nest In E end of culvert
10/15/2006	*Pronghorn	Segment 1B Transmission Line	Tracks along drainage
10/15/2006	*Rodent Burrows	Segment 1B Transmission Line	In higher mound N of depression
9/19/2006	*Badger	South Plant Site	Burrow
10/4/2006	*Burrowing Owl	South Plant Site	Two burrows Flagged and GPS Recorded
9/20/2006	*Coyote	South Plant Site	Coyote scat
10/10/2006	*Coyote	South Plant Site	Canid excavated burrow
9/19/2006	*Elk	South Plant Site	Scat
10/10/2006	*Elk	South Plant Site	Pellets
9/19/2006	*Fox	South Plant Site	Burrow
9/19/2006	*Mule Deer	South Plant Site	Pellets
10/11/2006	*Predator-Owl burrows	South Plant Site	Burrows along wetland drainage
9/19/2006	*Pronghorn	South Plant Site	Pellets
10/10/2006	*Pronghorn	South Plant Site	Pellets
10/10/2006	*Unidentified Canid	South Plant Site	Unidentified Canid Burrow
MISCELLANEOUS			
10/11/2006	Unknown Yellow Butterfly	ALT - Segment 3 Transmission Line	Flying; One film photo taken
11/17/2006	Amphipods & Planeria	Duck Creek Water Supply Line	
11/17/2006	Amphipods & Snails	Duck Creek Water Supply Line	
11/17/2006	Fish	Duck Creek Water Supply Line	Unidentified fish in two ponds
6/25/2007	Unknown Fish	Duck Creek Water Supply Lin	Three to Five Inches, Unknown

* Sign Only

Table 2 - TEPC Species That Inhabit the BLM Districts of the Project Area

Common Name	Scientific Name	Habitat Type	USFWS	BLM	Lincoln County	White Pine County	Elko County	Nye County	Clark County	JBR - Observed
Pygmy Rabbit	Brachylagus idahoensis	SB; MDV	UR	X		X	X	X		X
Yellow-billed cuckoo	Coccyzus americanus	R-W; PJ	C		X		X	X	X	
Relict leopard frog	Rana onca	R-W	C						X	
Southwestern willow flycatcher	Epidonax tralii extimus	R-W; PJ	LE		X			X	X	
Yuma clapper rail	Rallus longirostris yumanensis	R-W	LE					X	X	
White River springfish	Crenichthys baileyi baileyi	R-W	LE		X					
Hiko White River springfish	Crenichthys baileyi grandis	R-W	LE		X					
Devils Hole pupfish	Cyprinodon diabolis	R-W	LE					X	X	
Ash Meadows Amargosa pupfish	Cyprinodon nevadensis mionectes	R-W	LE					X		
Warm Springs pupfish	Cyprinodon nevadensis pectoralis	R-W	LE					X		
Pahrump poolfish	Empetrichthys latos	R-W	LE			X			X	
Humpback chub	Gila cypha	R-W	LE						X	
Bonytail chub	Gila elegans	R-W	LE						X	
Pahranagat roundtail chub	Gila robusta jordani	R-W	LE		X					
Virgin River chub	Gila seminude	R-W	LE	X	X				X	
White River spinedace	Lepidomeda albivallis	R-W	LE			X		X		
Moapa dace	Moapa coriacea	R-W	LE						X	
Woundfin	Plageopterus argentissimus	R-W	LE						X	
Colorado pikeminnow	Ptychocheilus lucius	R-W	LE						X	
Meadow Valley Wash speckled dace	Rhinichthys osculus ssp.	R-W	LE	X	X					
Razorback sucker	Xyrauchen texanus	R-W	LE						X	
Desert tortoise	Gopherus agassizii	MDV	LT		X			X	X	X
Railroad Valley springfish	Crenichthys nevadae	R-W	LT					X		
Big Spring spinedace	Lepidomeda mollispinis pratensis	R-W	LT		X					
Lohontan cutthroat trout	Oncorhynchus clarkii henshawi	R-W	LT				X	X	X	
Greater sage grouse	Centrocercus urophasiansus	R-W; SB	UR	X	X	X	X	X		X

Sources:
BLM Nevada Sensitive Species list, July 29, 2003
Nevada Heritage Program shape files, 2004
US Fish and Wildlife Service species list, 2004.
The Ely Field Office is maintaining ongoing coordination with the Fish and Wildlife Service offices
Las Vegas to ensure that any additions, deletions, or changes in species status will be updated in the RMP/EIS
Nevada Natural Heritage Program Detailed Rare Plant and Animal Species list, March 18, 2004
Nevada Natural Heritage Program Rare Plant Atlas, June 2001
Because this species is on the USFWS species list as a Species of Concern, it is being retained.
This species does not occur within the District boundary, but has been documented along the Virgin River.

USFWS Status:
LE - Federally listed as endangered
LT - Federally listed as threatened
C - Federal candidate species
PT - Proposed Threatened
UR – Under Review

Habitat Type
PJ - Pinyon-Juniper Woodlands
A - Aspen
C - High-elevation Conifer
R-W - Riparian Wetlands
MM - Mountain Mahogany
SB - Sagebrush
SDS - Salt Desert Shrub
MDV - Mojave Desert Vegetation
NNS - Non-Native Seedings

Table 3 - BLM and State of Nevada Sensitive Species That Inhabit the BLM Districts of the Project Area

Common Name	Scientific Name	Habitat Type	USFWS	BLM	Lincoln County	White Pine County	Elko County	Nye County	Clark County	JBR - Observed
MAMMALS										
Pallid bat	*Antrozous pallidus*	All		X	X	X	X			
Pygmy Rabbit	*Brachylagus idahoensis*	SB; MDV	PT	X		X	X	X		X
Townsend's big-eared bat	*Corynorhinus townsendii*	All		X		X	X	X	X	
Spotted bat	*Euderma maculatum*	All		X	X	X	X	X	X	
Silver-haired bat	*Lasionycteris noctivagans*	R-W; PJ; MC/A		X	X	X	X			
Hoary bat	*Lasiurus cinereus*	R-W; PJ MC/A		X	X	X	X			
Desert Valley kangaroo mouse	*Microdipodops*	SB; MDV		X	X					
Pahranganat bat	*Microtus montanus fucosus*	R-W; MDV		X	X					
Ash Meadows montane vole	*Microtus montanus nevadensis*	All		X				X		
California myotis	*Myotis californicus*	All		X	X	X		X	X	
Small-footed myotis	*Myotis ciliolabrum*	All		X	X	X	X	X		
Long-eared myotis	*Myotis evotis*	All		X		X	X			
Little brown myotis	*Myotis lucifugus*	All		X	X		X	X	X	
Fringed myotis	*Myotis thysandondes*	All		X	X	X	X	X	X	
Long-legged myotis	*Myotis volans*	PJ; MC/A		X	X	X	X			
Yuma myotis	*Myotis yumanensis*	All		X	X					
Desert bighorn sheep	*Ovis canadensis nelsoni*	MM		X	X	X				X
Western pipistrelle bat	*Pipistrellus hesperus*	All		X	X	X	X			
Brazilian free-tailed bat	*Tadarida brazilliensis*	All		X	X	X	X			
Fish Spring pocket gopher	*Thomomys bottae abstrusus*	All		X				X		
San Antonio pocket gopher	*Thomomys bottae curtatus*	All		X				X		
BIRDS										
Northern goshawk	*Accipiter gentiles*	MC/A; R-W; SB		X		X	X	X		
Golden eagle	*Aquila chrysaetos*	All		X	X	X	X			X
Short-eared owl	*Asio flammeus*	R-W		X		X	X			X
Long-eared owl	*Asio otus*	R-W; MC; MDV		X	X	X	X			
Western burrowing owl	*Athene cunicularia hypugea*	SB; MDV		X	X	X	X	X	X	
Juniper titmouse	*Baeolophus griseus*	MC; SB; MDV		X	X	X	X			
Ferruginous hawk	*Buteo regalis*	PJ; R-W; MDV; SB		X	X	X	X	X	X	X
Swainson's hawk	*Buteo swainsoni*	PJ; MDV; SB		X	X	X	X	X		
Greater sage grouse	*Centrocercus urophasiansus*	R-W; SB	PT	X	X	X	X	X		X
Western snowy plover	*Charadrius alexandrinus nivosus*	R-W		X		X	X	X		
Black tern	*Childonias niger*	R-W		X		X	X	X		

Common Name	Scientific Name	Habitat Type	USFWS	BLM	Lincoln County	White Pine County	Elko County	Nye County	Clark County	JBR - Observed
Yellow-billed cuckoo	*Coccyzus americanus*	R-W; PJ	C		X		X	X	X	
Southwestern willow flycatcher	*Epidonax tralii extimus*	R-W; PJ	LE		X			X	X	
Prairie falcon	*Falco mexicanus*	MDV		X	X	X	X			X
Sandhill Crane	*Grus canadensis*	R-W		X	X	X	X			X
Pinyon jay	*Gymnorhinus*	R-W; MC; MDV		X	X	X	X			X
Bald eagle	*Haliaeetus luecocephalus*	All			X	X	X	X	X	
Yellow-breasted chat	*Icteria virens*	R-W		X	X	X	X			
Least bittern	*Ixobrychus exilis*	R-W		X	X		X	X	X	X
Loggerhead Shrike	*Lanius ludovicianus*	R-W		X	X	X	X			X
Black rosy-finch	*Leucosticte atrata*	SB		X	X	X	X			
Lewis' woodpecker	*Melanerpes lewis*	R-W		X		X	X			
Long-billed curlew	*Numenius americanus*	R-W		X	X	X	X			
Mountain quail	*Oreotyx pictus*	PJ; R-W		X				X		
Flammulated owl	*Otus flammeolus*	R-W		X	X	X	X	X	X	
American White Pelican	*Pelicanus erythrorhynchos*	R-W		X			X			
Phainopepla	*Phainopepla nitens*	MDV; PJ		X	X			X	X	
White-faced ibis	*Plegadis chihi*	R-W		X				X		
Vesper sparrow	*Pooecetes gramineus*	SB; MDV; PJ		X	X	X	X			
Yuma clapper rail	*Rallus longirostris yumanensis*	R-W	LE					X	X	
Red-naped sapsucker	*Sphyrapicus nuchalis*	R-W		X	X	X	X			
Crissal thrasher	*Toxostoma crissale*	MDV: R-W; PJ		X	X					
Lucy's warbler	*Vermivora luciae*	R-W; MDV; SB		X	X					
Gray vireo	*Vireo vicinior*	PJ; WC; MDV; SB		X	X					
REPTILES										
Desert tortoise	*Gopherus agassizii*	MDV	LT		X			X	X	X
Banded gila monster	*Heloderma supectum cinctum*	R-W		X	X			X	X	
Sonoran mountain kingsnake	*Lampropeltis pyromelana*	R-W		X		X				
Short-horned lizard	*Phrynosoma douglassii*	WC; SB; MDV		X		X	X			
Chuckwalla	*Sauromalus obesus*	MDV		X	X					
AMPHIBIANS										
Southwestern toad, Arizona toad	*Bufo microscaphus microscaphus*	R-W		X	X				X	
Columbia spotted frog (Great Basin pop)	*Rana luteiventris pop*	R-W		X			X	X		
Relict leopard frog	*Rana onca*	R-W	C						X	
Northern leaopard frog	*Rana pipens*	R-W		X	X	X	X			

Common Name	Scientific Name	Habitat Type	USFWS	BLM	Lincoln County	White Pine County	Elko County	Nye County	Clark County	JBR - Observed
FISH										
White River desert sucker	*Catostomus clarki intermedius*	R-W		X	X	X		X		
Meadow Valley Wash desert sucker	*Catostomus clarki ssp.*	R-W		X	X					
Flannelmouth sucker	*Catostomus latipinnis*	R-W		X					X	
White River sculpin	*Cottus ssp.*	R-W		X				X		
Shorthead Sculpin	*Cottus confusus*	R-W		X			X			
Preston White River springfish	*Crenichthys baileyi albivallis*	R-W		X		X				
White River springfish	*Crenichthys baileyi baileyi*	R-W	LE		X					
Hiko White River springfish	*Crenichthys baileyi grandis*	R-W	LE		X					
Moorman White River springfish	*Crenichthys baileyi thermophilus*	R-W		X				X		
Moapa White River springfish	*Crenichthys baileyi moapae*	R-W		X					X	
Railroad Valley springfish	*Crenichthys nevadae*	R-W	LT					X		
Devils Hole pupfish	*Cyprinodon diabolis*	R-W	LE					X	X	
Ash Meadows Amargosa pupfish	*Cyprinodon nevadensis mionectes*	R-W	LE					X		
Warm Springs pupfish	*Cyprinodon nevadensis pectoralis*	R-W	LE					X		
Pahrump poolfish	*Empetrichthys latos*	R-W	LE			X			X	
Newark Valley tui chub	*Gila bicolor newarkensis*	R-W		X		X				
Big Smoky Valley tui chub	*Gila bicolor ssp.*	R-W		X				X		
Charnock Springs tui chub	*Gila bicolor ssp.*	R-W		X				X		
Duckwater Creek tui chub	*Gila bicolor ssp.*	R-W		X				X		
Hot Creek Valley tui chub	*Gila bicolor ssp.*	R-W		X				X		
Independence Valley tui chub	*Gila bicolor ssp.*	R-W		X			X			
Little Fish Lake Vallet tui chub	*Gila bicolor ssp.*	R-W		X				X		
Railroad Valley tui chub	*Gila bicolor ssp.*	R-W		X		X		X		
Leatherside chub	*Gila copei*	R-W		X			X			
Humpback chub	*Gila cypha*	R-W	LE						X	
Bonytail chub	*Gila elegans*	R-W	LE						X	
Pahranagat roundtail chub	*Gila robusta jordani*	R-W	LE		X					
Virgin River chub	*Gila seminude*	R-W	LE	X	X				X	
White River spinedace	*Lepidomeda albivallis*	R-W	LE			X		X		
Virgin River spinedace	*Lepidomeda mollispinis mollispinis*	R-W		X	X				X	
Big Spring spinedace	*Lepidomeda mollispinis pratensis*	R-W	LT		X					
Moapa dace	*Moapa coriacea*	R-W	LE						X	

Common Name	Scientific Name	Habitat Type	USFWS	BLM	Lincoln County	White Pine County	Elko County	Nye County	Clark County	JBR - Observed
Lahontan cutthroat trout	*Oncorhynchus clarkii henshawi*	R-W	LT				X	X	X	
Bonneville cutthroat trout	*Oncorhynchus clarkii utah*	R-W		X		X	X			
Inland Columbia Basin redband trout	*Oncorhynchus mykiss gairdneri*	R-W		X			X			
Woundfin	*Plageopterus argentissimus*	R-W	LE						X	
Colorado pikeminnow	*Ptychocheilus lucius*	R-W	LE						X	
Relict dace	*Relictus solitarius*	R-W		X		X	X			
Longnose dace	*Rhinichthys cataractae*	R-W		X			X			
Independence Valley speckled dace	*Rhinichthys osculus lethoporus*	R-W		X			X			
Big Smoky Valley speckled dace	*Rhinichthys osculus larversi**	R-W		X				X		
Moapa speckled dace	*Rhinichthys osculus moapae*	R-W		X					X	
Ash Meadows speckled dace	*Rhinichthys osculus nevadensis*	R-W		X				X		
Clover Valley speckled dace	*Rhinichthys osculus oligoporus*	R-W		X			X			
Meadow Valley Wash speckled dace	*Rhinichthys osculus ssp.*	R-W	LE	X	X					
Monitor Valley speckled dace	*Rhinichthys osculus ssp.*	R-W		X				X		
Oasis Valley speckled dace	*Rhinichthys osculus ssp.*	R-W		X				X		
White River speckled dace	*Rhinichthys osculus ssp.*	R-W		X		X		X		
Pahranagat speckled dace	*Rhinichthys osculus velifer*	R-W		X	X					
Jarbridge River bull trout	*Salvelinus confluentus pop*	R-W		X			X			
Razorback sucker	*Xyrauchen texanus*	R-W	LE						X	
INVERTEBRATES										
California floater	*Anadonta californiensis*	R-W		X			X			
White River wood nymph	*Cercyonis pegala pluvialis*	R-W		X	X	X				
Baking Powder Flat blue	*Euphilotes bernadino minuta*	MDV		X		X				
Koret's chckerspot	*Euphydryas editha koreti*	MC/A		X		X				
Railroad Valley uncas skipper	*Hesperia uncas fulvapalla*	MDV		X		X				
White River uncas skipper	*Hesperia uncas grandiosa*	R-W		X		X				
Schell Creek mountainsnail	*Oreohelix nevadensis*	R-W		X		X				
Pahranagat naucorid bug	*Pelocoris shoshone shoshone*	R-W		X	X					
Steptoe Valley crescentspot	*Phycoides pascoensis arenacolor*	R-W		X		X				
Duckwater pyrg	*Pyrgulopsis aloba*	R-W		X				X		
Southern duckwater pyrg	*Pyrgulopsis anatine*	R-W		X				X		
Moapa pebblesnail	*Pyrgulopsis avernalis*	R-W		X					X	
Flag springsnail	*Pyrgulopsis breviloba*	R-W		X	X			X		

Common Name	Scientific Name	Habitat Type	USFWS	BLM	Lincoln County	White Pine County	Elko County	Nye County	Clark County	JBR - Observed
Cortez Hills pebblesnail	*Pyrgulopsis bryantwalkeri*	R-W		X			X			
Moapa Valley springsnail	*Pyrgulopsis carinifera*	R-W		X					X	
Blue Point springsnail	*Pyrgulopsis coloradensis*	R-W		X					X	
Transverse gland pyrg	*Pyrgulopsis cruciglans*	R-W		X		X	X			
Crystal Spring springsnail	*Pyrgulopsis crystalis*	R-W		X				X		
Spring Moutains pyrg	*Pyrgulopsis deaconi*	R-W		X		X			X	
Ash Meadows pebblesnail	*Pyrgulopsis erythropoma*	R-W		X				X		
Fairbanks springsnail	*Pyrgulopsis fairbanksensis*	R-W		X				X		
Corn Creek springsnail	*Pyrgulopsis fausta*	R-W		X					X	
Emigrant springsnail	*Pyrgulopsis gracilis*	R-W		X				X		
Upper Thousand Spring springsnail	*Pyrgulopsis hovinghi*	R-W		X			X			
Hubbs pyrg	*Pyrgulopsis hubbsi*	R-W		X	X					
Humboldt pyrg	*Pyrgulopsis humboldtensis*	R-W		X			X			
Enlongate-gland springsnail	*Pyrgulopsis isolata*	R-W		X				X		
Landyes pyrg	*Pyrgulopsis landeyi*	R-W		X		X				
Butterfield springsnail	*Pyrgulopsis lata*	R-W		X				X		
Lockes springsnail	*Pyrgulopsis lockensis*	R-W		X				X		
Crittenden springsnail	*Pyrgulopsis lentiglan*	R-W		X			X			
Elko springsnail	*Pyrgulopsis leporina*	R-W		X			X			
Hardy springsnail	*Pyrgulopsis marcida*	R-W		X	X			X		
Pahranagat pebblesnail	*Pyrgulopsis merriami*	R-W		X	X					
Twentyone mile springsnail	*Pyrgulopsis millenaria*	R-W		X			X			
Camp Valley springsnail	*Pyrgulopsis montana*	R-W		X	X					
Sub-globose Steptoe Ranch pyrg	*Pyrgulopsis orbiculata*	R-W		X		X				
Big Warm Spring pyrg	*Pyrgulopsis papillata*	R-W		X						
Bifid duct pyrg	*Pyrgulopsis peculiaris*	R-W		X		X				
Northern Steptoe springsnail	*Pyrgulopsis serrata*	R-W		X			X			
Lake valley springsnail	*Pyrgulopsis sublata*	R-W		X	X					
Southern Steptoe pyrg	*Pyrgulopsis sulcata*	R-W		X		X				
Southeast Nevada springsnail	*Pyrgulopsis turbatrix*	R-W		X					X	
Northwest Bonneville springsnail	*Pyrgulopsis variegata*	R-W		X			X			
Duckwater warm springs pyrg	*Pyrgulopsis villacampae*	R-W		X						

Common Name	Scientific Name	Habitat Type	USFWS	BLM	Lincoln County	White Pine County	Elko County	Nye County	Clark County	JBR - Observed
Vinyards pyrg	*Pyrgulopsis vinyardi*	R-W		X			X			
Grated tryonia	*Tryonia clathrata*	R-W		X	X				X	

Sources:
BLM Nevada Sensitive Species list, July 29, 2003
Nevada Heritage Program shape files, 2004
US Fish and Wildlife Service species list, 2004. The Ely Field Office is maintaining ongoing coordination with the Fish and Wildlife Service offices
Las Vegas to ensure that any additions, deletions, or changes in species status will be updated in the RMP/EIS
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PT - Proposed Threatened

Habitat Type
PJ - Pinyon-Juniper Woodlands
A - Aspen
C - High-elevation Conifer
R-W - Riparian Wetlands
MM - Mountain Mahogany
SB - Sagebrush
SDS - Salt Desert Shrub
MDV - Mojave Desert Vegetation
NNS - Non-Native Seedings

Appendix 4A
Air Resources

APPENDIX 4A – AIR RESOURCES

4A.1 Introduction

This appendix supports the EEC DEIS by providing details to support the air emissions and air pathway impact assessment results reported in **Section 4.6** of the EIS. This appendix is structured with primary headers by project alternative for the two action alternatives. Sub headers under each plant alternative are consistent with the order and presentation in the DEIS to allow for ease in verifying the details in this appendix that support the summary conclusions reported in **Section 4.6**.

4A.2 Proposed Action: South Plant Site

4A.2.1 Direct and Indirect Effects on Air Quality from Plant Site

Construction

Construction of the power plant would involve earthmoving activity. Earthmoving activity associated with construction projects typically causes emissions of particulates, also known as fugitive dust. The estimation of a PM_{10} emission rate considers the actual level of activity at the site and the effect of controls typically employed. For fugitive dust control it was assumed that ground surfaces would undergo watering while being actively disturbed by earthmoving equipment. For general construction activity in desert soils (plant site, transmission line access roads, etc.), a generally accepted estimate of PM_{10} emissions is 0.11 tons/acre/month of active disturbance (WRAP 2006).

The total land area needed for the plant site would be 2,970 acres for a projected time of 60 months to complete. It is estimated that at any one time 300 acres would be actively disturbed during the 60-month period. At a PM_{10} emission factor of 0.11 tons/acre/month, the total PM_{10} emissions are estimated to be 1,980 tons during plant construction.

Tailpipe emissions from construction equipment and worker passenger vehicles would also occur. Construction and delivery vehicles are expected to combust primarily diesel fuel while passenger vehicles are expected to combust gasoline. Tailpipe emissions include PM_{10}, nitrogen oxide (NOx), sulfur dioxide (SO_2), carbon monoxide (CO) and volatile organic compounds (VOC). Emission factors for construction equipment were obtained from the EPA non-road emission factor document EPA 420-P-04-009. Duration of construction equipment and horsepower ratings were obtained from the Proponent. It was assumed that earthmoving activities would take place eight hours per day at an average of 22 days per month. Based on a 60-month construction time schedule the construction equipment tailpipe emissions were estimated to be 186.1 tons of VOC, 1,028.6 tons of CO, 3,529.9 tons of NOx, 170.9 tons of PM_{10}, and 3.14 tons of SO_2.

Total emissions for gasoline-fueled pickup trucks and crew cabs were calculated based on a traveling distance of 8 miles round trip per day during power plant construction from the associated worker village. For employee vehicles the average light duty vehicle gasoline emission factor was used from the EPA MOBILE6 program. For delivery trucks, the MOBILE6 light duty diesel truck emission factor was used. Based on a 60-month construction time schedule the plant vehicle tailpipe emissions were estimated to be 0.42 tons of VOC, 4.3 tons of CO, 0.34 tons of NOx, 0.01 tons of PM_{10}, and 0.005 tons of SO_2.

Based on a 60-month construction time schedule the total plant construction vehicle and equipment tailpipe emissions were estimated to be 187 tons of VOC, 1,033 tons of CO, 3,530 tons of NO_x, 171 tons of PM_{10}, and 3.1 tons of SO_2.

In addition to tailpipe vehicular emissions from vehicular traffic generated, fugitive PM_{10} emissions would occur from re-entrained dust from road surfaces. The same assumptions regarding number of vehicles and delivery trucks described above were used to estimate fugitive dust emissions. Emission factors were developed, and PM_{10} emissions were calculated. Emission factors for paved road travel were calculated based on an average vehicle weight of 2.5 tons and surface silt content of 8.5 percent. The paved road traveling distance was estimated to be 6 miles round trip per day. Emission factors for unpaved road travel were calculated based on a surface silt content of 18.4 percent, an average vehicle weight of 2.5 tons, and 90 mean days per year with 0.01 inch or more of precipitation. Travel over unpaved roads was estimated at 2 miles round trip per day. The maximum 60-month PM_{10} fugitive emissions resulting from employees commuting were estimated to be 67.6 tons.

Portable concrete batch plants are expected for plant construction. Using controlled truck loading emission factors from EPA AP-42, 5th Edition, Tables 11.12-2, and 11.12-5, at an estimated 60 cu yd/hr and 158,100 cu yd/yr, the PM_{10} emissions are estimated to be 23 tons per year.

Operations, Maintenance, and Abandonment

Emissions

Coal Usage

Based on the permit application, the design coal feed rate at 100 percent load is 538 tons/hr per unit and 4,709,852 tons/year per unit. For two units combined the coal feed rate is 1,076 tons/hr and 9,425,760 tons/year. The average coal heating value is 8,100 BTU/lb.

Criteria Air Pollutants

Criteria air pollutant emission rates were obtained from Table 4.1 of the Class I Application Review prepared by the State of Nevada, Division of Environmental Protection (NDEP) Bureau of Air Pollution Control (BAPC) (October 2007). **Table 4.6-1** in **Section 4.6** of the DEIS provides a summary of the facility-wide potential to emit (PTE) criteria air pollutants. The summary includes all onsite operational emissions, including those from coal trains on site. It does not include commuter vehicles and some onsite vehicular traffic not related to production. These emission rates are based upon conservative assumptions that both Phase 1 generating units at the plant site would operate continuously for 8,760 hours per year at full-load operations at the high end of the requested range of emission rates, and all support systems would operate sufficiently to support continuous operation. In actuality, maintenance and practicality would ensure that actual operations would not reach that assumed operating rate, so actual emissions would be lower than the PTE documented.

HAPs

A substance is designated as a hazardous air pollutant (HAP) by regulation of the Nevada State Environmental Commission, adopted by reference from the EPA list in 42 U.S.C. 7412(b). **Table 4A.2-1** documents the plant site's HAP PTE documented in the air permit application.

TABLE 4A.2-1. HAP POTENTIAL TO EMIT (TONS/YEAR)

POLLUTANT	TOTAL ANNUAL EMISSIONS (TONS/YR)	POLLUTANT	TOTAL ANNUAL EMISSIONS (TONS/YR)
Acetaldehyde	2.685	Methyl methacrylate	0.094
Acetophenone	0.071	Methyl tert butyl ether	0.165
Acrolein	1.366	Methylene chloride	0.236
Benzene	6.140	Naphthalene	0.064
Benzyl chloride	3.297	Phenol	0.075
Biphenyl	0.008	Propionaldehyde	1.790
Bis(2-ethylhexyl)phthalate (DEHP)	0.344	Propylene	0.062
Bromoform	0.184	Styrene	0.118
1,3 – Butadiene	1.29E-05	Tetrachloroethylene	0.203
Carbon disulfide	0.612	Toluene	1.137
2-Chloroacetophenone	0.033	1,1,1 -Trichloroethane (Methylchloroform)	0.094
Chlorobenzene	0.104	Vinyl acetate	0.086
Chloroform	0.278	Xylenes	0.179
Cumene	0.025	Antimony	0.086
Dimethyl sulfate	0.226	Arsenic	2.005
2,4-Dinitrotoluene	0.001	Beryllium	0.150
Ethyl benzene	0.443	Cadmium	0.243
Ethyl chloride	0.198	Chromium	1.254
Ethylene dichloride	0.148	Chromium (VI)	0.372
Ethylene dibromide	0.006	Cobalt	0.471
Formaldehyde	1.324	Hydrogen chloride	339.1
Hexane	0.316	Hydrogen fluoride	30.52
Isophorone	2.732	Manganese	2.359
Methyl bromide	0.754	Mercury	0.150
Methyl chloride	2.496	Nickel	1.372
Methyl hydrazine	0.801	Selenium	6.130

Those HAP emission levels would qualify the EEC as a major source of HAPs under Federal New Source Review regulations, requiring Maximum Available Control Technology (MACT) for HAPs at the facility's energy production boilers. Emission controls to meet MACT requirements are those used for criteria emission control and are discussed above under criteria air pollutant BACT controls. Activated carbon injection would be used for mercury control.

Employee Commuter Emissions

Tailpipe pollutants would be emitted from vehicles used by employees commuting to and from the plant site. The EPA MOBILE6 model for light duty vehicles based on default conditions was used to estimate emissions. Assuming 150 employees, 4 employees per vehicle, 8 miles round trip per day, and a seven-day work week, the annual tailpipe emissions were estimated to be 0.14 tons of VOC, 1.5 tons of CO, 0.1 tons of NO_x, 0.003 tons of PM_{10}, and 0.002 tons of SO_2.

In addition to tailpipe vehicular emissions by worker commute, fugitive PM_{10} emissions would occur from re-entrained dust from road surfaces. The same assumptions regarding number of employees and use of ride sharing for plant operations just described were used to estimate fugitive dust emissions. Paved and unpaved estimates for road silt content, vehicle weight, and precipitation are the same as that used for estimating fugitive road emissions for construction activities. The paved road traveling distance is estimated to be 6 miles round trip per day. Travel over unpaved roads was estimated at 2 miles round trip per day. The maximum annual

PM_{10} fugitive emissions resulting from employees commuting were estimated to be 22 tons/year.

Abandonment

Abandonment of the associated worker village to support construction, if necessary, could have limited emissions of dust or windborne materials if deconstruction was required. Localized minor short-duration impacts could result from deconstruction. EEC abandonment, if necessary in the future, would require maintenance to ensure limited emissions from the onsite disposal area and coal handling areas. It could also include disassembly of some or all facility structures and improvements, which would result in short duration emissions during the process that could briefly represent significant contributions to air pollutant levels near the plant boundary, but would be minor beyond a few hundred yards including at all identified areas of regular human activity.

<u>*Ambient Air Quality Impacts*</u>

The facility's "Application for Operating Permit to Construct" was determined by the NDEP to demonstrate that the proposed EEC's impacts under the Proposed Action would meet all applicable ambient air quality impact limits. Appendix A9 in Volume 4 of that permit application, the "Air Quality Impact Analysis and Dispersion Modeling Files," documents the details by which the EEC meets all applicable ambient air quality impact limits under all South Plant Site project alternatives.

The predicted impacts of onsite plant site operations, including unloading and management of coal and supplies and the onsite ash disposal area, are summarized below in terms of potential impacts on: 1) Class I areas and FLM identified sensitive Class II areas, 2) Class II areas, 3) Visibility and Regional Haze, 4) Deposition of nitrates and sulfates, and 5) Risks to human and ecological health.

Class I Area and FLM Identified Sensitive Class II Area Impacts

Air quality modeling analyses verified by NDEP showed that maximum NO_2 and PM_{10} impacts predicted in the two Class I areas evaluated and maximum predicted impacts for all three pollutants at the FLM-identified sensitive Class II areas were below the PSD significant contribution thresholds (the PSD Class SILs) at both Class I areas and both FLM-identified Class II areas. SO_2 impacts were determined by NDEP to exceed the Class I significant contribution threshold), the threshold above which cumulative incremental degradation analyses are required. Those modeling results are documented in **Table 4A.2-2**.

Because the predicted maximum SO_2 impacts exceeded the PSD SILs for the two Class I areas, a cumulative analysis of increment consumption since the baseline dates for PSD for SO_2 in the areas of those two areas was conducted consistent with NDEP requirements. The details of that cumulative SO_2 analysis are documented in **Section 5.6** of the DEIS.

TABLE 4A.2-2. SOUTH PLANT SITE LONG-RANGE TRANSPORT PSD MODELING RESULTS

POLLUTANT	AVERAGING PERIOD	MODELED CONCENTRATION FOR METEOROLOGICAL YEAR (μG/M³)			SIGNIFICANT CONTRIBUTION THRESHOLD (PSD CLASS I SIL)
		2002	2003	2004	(μg/m³)
JARBIDGE WA (CLASS I)					
NO_2	Annual	0.0005	0.002	0.002	0.1
SO_2	3 hours	[illegible].01	2.02	1.12	[illegible].3
	24 hours	0.30	0.41	0.33	0.2
	Annual	0.01	0.01	0.01	0.1
PM_{10}	24 hours	0.17	0.18	0.1[illegible]	0.3
	Annual	0.004	0.005	0.006	0.2
ZION NP (CLASS I)					
NO_2	Annual	0.001	0.001	0.001	0.1
SO_2	3 hours	0.58	0.5[illegible]	1.04	[illegible].3
	24 hours	0.15	0.11	0.[illegible]3	0.2
	Annual	0.01	0.01	0.01	0.1
PM_{10}	24 hours	0.[illegible]2	0.05	0.10	0.3
	Annual	0.003	0.003	0.003	0.2
GREAT BASIN NP (CLASS II)					
NO_2	Annual	0.1[illegible]	0.11	0.10	1
SO_2	3 hours	8.[illegible]3	9.14	10.21	25
	24 hours	2.[illegible]2	[illegible].81	2.81	5
	Annual	0.1[illegible]	0.15	0.1[illegible]	1
PM_{10}	24 hours	1.05	0.67	1.08	5
	Annual	0.07	0.36	0.06	1
RUBY LAKE NWR (CLASS II)					
NO_2	Annual	0.002	0.005	0.008	1
SO_2	3 hours	2.53	2.03	2.92	25
	24 hours	0.83	0.61	1.02	5
	Annual	0.02	0.02	0.03	1
PM_{10}	24 hours	0.56	0.36	0.43	5
	Annual	0.011	0.010	0.014	1

Class II Area Impacts

Shaded areas in **Figures 4.6-1** and **4.6-2** of the DEIS show the areas where maximum air quality impacts exceeding Class II SILs are predicted for NO_2, SO_2, and PM_{10}, respectively. Class II SILs for CO are not predicted to be exceeded. The maximum distances at which significant contributions to air pollutant levels were predicted from the EEC extend from the property boundary are shown below in **Table 4A.2-3**.

TABLE 4A.2-3. MAXIMUM EXTENT OF PREDICTED SIGNIFICANT CONTRIBUTION TO AIR POLLUTANT LEVELS IN AND AROUND THE SOUTH PLANT SITE

POLLUTANT	MAXIMUM EXTENT OF SIGNIFICANT CONTRIBUTION EEC METEOROLOGICAL DATA (KM)	MAXIMUM EXTENT OF SIGNIFICANT CONTRIBUTION ELY YELLAND FIELD METEOROLOGICAL DATA (KM)
NO_2	8.8	20.8
SO_2	43.8	50[a]
PM_{10}	12.4	13.6

Notes: (a) Per New Source Review Workshop Manual, Draft October 1990, pp.C.26 (EPA 1990)

The maximum impacts predicted from the South Plant Site operations are quantified below in **Table 4A.2-4**. That table shows that plant site operation impacts would not exceed federal and state limits for incremental degradation, and that facility impacts combined with measured background concentrations would not approach national or Nevada ambient air quality standards.

Analyses in **Section 5.6** of the DEIS include the effects on all other current or reasonably foreseeable sources in a cumulative assessment of ambient air quality when the proposed facility would be operating at maximum potential, and cumulative incremental degradation since threshold dates against applicable impact limits under those conditions.

The only pollutant for which the proposed EEC would have predicted significant contributions to air quality levels in any Class II area with special land management designation is SO_2. PM_{10} and NO_2 significant contributions are limited to Steptoe Valley, and there are no predicted areas of significant CO contributions from the South Plant Site operation. The significant SO_2 contribution contours shown in **Figures 4.6-1** and **4.6-2** of the DEIS reach or cover portions of the Bristlecone and High Schells Wildernesses and the Steptoe Valley Wildlife Management Area. The human and ecological risk assessment analyses described later in this section further define potential impacts and human and ecological risks within 50 kilometers of the proposed EEC, including those and other Class II areas with special land management designations.

Impacts from abandonment, if that occurs, would be comparable to construction impacts discussed, but limited in magnitude and duration, and would primarily affect only the immediate vicinity of the plant site. The onsite disposal area, and possibly other portions of the closed EEC plant site, would be maintained to minimize offsite impacts.

Visibility / Regional Haze

Quantitative estimates of Δb_{ext} were prepared to estimate visibility extinction for the two Class I areas and the two identified sensitive Class II areas selected by the FLMs, using meteorological data from the years 2002 through 2004 using the proposed FLAG methodology update utilized in recent WRAP regional air quality modeling study featuring a tiered set of analyses using CALPUFF Method 6 post-processing, and the historic FLAG methodology featuring CALPUFF Method 2 post-processing.

TABLE 4A.2-4. AIR QUALITY MODELING PREDICTED MAXIMUM: SOUTH PLANT SITE

POLLUTANT	AVER. PERIOD	EEC MET. DATA MAXIMUM MODELED CONC. ($\mu G/M^3$)[A]	ELY YELLAND FIELD MET. DATA MAXIMUM MODELED CONC. ($\mu G/M^3$)[A]	BACKGR. CONCS. MEAS. ONSITE ($\mu G/M^3$)	TOTAL CONCS EEC MET. DATA IMPACT PLUS BACKGR. ($\mu G/M^3$)	DISTANCE AND ORIENTATION OF MAXIMUM IMPACT LOCATION FROM PROPOSED BOILER STACKS	PSD INCR. LIMIT IN CLASS II AREAS	NAAQS AND NEVADA AAQS ($\mu G/M^3$)
NO_2	Annual	5.2	3.3	3.7	8.9	1.4 miles NNW	25	100
PM_{10}	24 hours	31.9	20.9	19.0	50.9	1.3 miles NNW	30	150
	Annual	9.4	3.7	7.0	16.4	1.3 miles N	17	50
SO_2	3 hours	176	311	4.0	180.0	4.5 miles SE	512	1300
	24 hours	34.0	12.5	3.0	37.0	4.5 miles ESE	91	365
	Annual	6.9	0.66	3.0	9.9	12.9 miles NNE	20	80
CO	1 hour	457	478	2415	2862	4.5 miles ENE	NA	40000
	8 hours	64.9	61.7	2358	2423	0.9 miles ESE	NA	10000

[A] The NO_x to NO_2 conversion factor of 0.75 is applied

In the analysis utilizing the proposed FLAG updated methodology, predicted visibility degradation was under the Tier I screening threshold of a maximum five percent increase in b_{ext} at Zion National Park, but exceeded that threshold at the Jarbidge Wilderness Area. A Tier 2 analysis was performed. **Table 4A.2-5** shows that the maximum visibility degradation predicted in the Tier II analysis (above average visibility conditions) over all days for the three years studied at Zion National Park was a 2.7 percent increase in Δb_{ext}. FLAG guidance defines a change in b_{ext} of five percent as a level of concern, and a change in b_{ext} of ten percent as an analysis threshold beyond which the FLM is likely to object unless there is mitigation. Therefore, visibility impacts from the Proposed Action at Zion National Park are within FLAG recommended range. For the Jarbidge Wilderness Area, **Table 4A.2-5** shows predicted increases in Δb_{ext} reached as high as 7.4 percent. All days with predicted visibility impairments over five percent occurred during the cold weather season.

TABLE 4A.2-5. SOUTH PLANT SITE CLASS I VISIBILITY IMPACT MODELING TIER 2 ANALYSIS RESULTS

VISIBILITY PARAMETER	AVERAGING PERIOD	MODELED MAXIMUM IMPACT FOR METEOROLOGICAL YEAR (% DEGRADATION)			SCREENING THRESHOLD
		2002	2003	2004	
JARBIDGE WA (CLASS I)					
Max Δb_{ext} (%)	24 hours	5.7	5.9	6.3	5%
No. days > 5%	NA	3	1	5	NA
No. days > 10%	NA	0	0	0	NA
ZION NP (CLASS I)					
Max Δb_{ext} (%)	24 hours	2.5	2.3	2.8	5%
No. days > 5%	NA	5	0	0	NA
No. days > 10%	NA	0	0	0	NA
GREAT BASIN NP (CLASS II)					
Max Δb_{ext} (%)	24 hours	18.8	15.5	15.8	NA
No. days > 5%	NA	77	60	57	NA
No. days > 10%	NA	20	23	20	NA
RUBY LAKE NWR (CLASS II)					
Max Δb_{ext} (%)	24 hours	11.4	8.9	11.4	NA
No. days > 5%	NA	14	7	16	NA
No. days > 10%	NA	1	0	3	NA

Note: NA Not applicable

Analysis of conditions on the nine days over the three years that visibility extinction reached the lower end of the FLAG screening threshold in the Jarbidge Wilderness Area showed that all nine days occurred in November, December, or January. All but three of the nine days were associated with weather events documented at the two National Weather Service (NWS) stations in the vicinity (in Ely and Elko). The other six days all featured mist or precipitation reported at one or both of the NWS observation stations. The infrequent occurrence of modeled values exceeding five percent based on the Tier 2 analysis, the lack of any days with predicted increases in b_{ex} over ten percent, the reasonable but conservative modeling analysis, weather

conditions on all nine days that would limit visibility, and the high level of pollution control proposed at the South Plant Site, NDEP concurred that the analyses indicate that Class I area visibility impacts from the Proposed Action would be within ranges recommended by the FLAG guidance.

Visibility analyses prepared using the historic FLAG guidance employing CALPUFF Method 2 post-processing indicated a similar pattern of maximum impacts predicted in the cold weather season. That analysis showed 34 days total and 12 days without precipitation or extensive cloud cover with b_{ext} increases as a result of the Proposed Action over five percent at the Jarbidge Wilderness Area in the three years studied, and seventeen days total and five days without precipitation or extensive cloud cover in three years with b_{ext} increases as a result of the Proposed Action over five percent at Zion National Park. The Method 2 analyses showed seventeen days in three years at Jarbidge Wilderness Area and four days at Zion National Park with b_{ext} increases as a result of the Proposed Action over ten percent. Only two of those days did not feature precipitation or significant overcast.

Both visibility analyses show visibility impacts exceeding the FLAG recommend thresholds for Δb_{ext} at each of the FLM-identified sensitive Class II areas. The methodologies employed are considered appropriate for visibility impact analyses in Class II areas as well as Class I areas, but federal and state legislation and air permitting regulations provide direct methods for enforcing those visibility impact thresholds in Class I areas that are not as well defined for Class II areas.

NDEP concurred during their review of the facility's permit application that the visibility analyses described demonstrate compliance with applicable visibility impact limits.

An analysis was prepared for the near-field (< 50 km distance) to assess the potential for inversions to trap pollutants in Steptoe Valley (Tetra Tech 2007). That study showed that ambient temperature inversions are common in the evenings. They are less common and limited in extent during the daylight hours, especially in the summer. Analyses of plume height and transport indicated that the exhaust plume from the proposed plant site would be well above almost all evening inversions, and that the models used to predict dispersion of the plume in ambient air would reasonably estimate concentrations in Steptoe Valley in all vertical mixing profiles including inversions. The air quality modeling results reported above include air dispersion results under inversion conditions.

Another analysis was performed to assess the extent to which fog formation associated with plant site operations would cut down visibility in the vicinity, and especially along Highway 93 (Farstad and Hacker 2007). The cooling towers are only proposed to operate when air temperatures are over 32 degrees, which represents 70 percent of the time in Ely. Climatological data shows that high humidity (dew point within two degrees of temperature) with temperatures above freezing occurs only two percent of the time in the area.

The model CALPUFF is the only EPA-approved model with guidance for making fog and icing impact assessments, and was applied consistent with its user's guidance to assess the potential for fog formation in the area around the plant site cooling towers, and from there to and across Highway 93. The same 2002 meteorological data set used in the visibility analysis was used in the fog and ice formation analysis. The Ely airport reported 20 days with fog and 51 days with ice conditions in 2002. No ice formation was predicted because the wet cooling towers would not be operated when temperatures were below freezing. The model showed that condensed water vapor would be visible at the cooling tower release points most of the year (7,300 hours out of 8,760), but that the water vapor would evaporate quickly and would not contribute to fog

formation offsite on any day modeled. The model results suggest that the combination of atmospheric conditions in the area and the EEC operations would not produce any increase in fogging or icing that would be noticeable along Highway 93.

Deposition of Nitrates, Sulfates, and Other Compounds

Quantitative estimates of deposition of nitrates and sulfates prepared for the Class I areas and sensitive Class II areas selected by the FLMs consistent with FLAG guidance address the potential for deposition of acids with those two elements as components. The results of that analysis, displayed in **Table 4A.2-6**, show long-term model predicted deposition levels at Class I areas Zion National Park and the Jarbidge Wilderness Area, and also for Great Basin National Park and Ruby Lake National Wildlife Refuge. The BLM recommends a threshold of 3 kilograms per hectare per year total deposition of sulfur and 5 kilograms per hectare per year total deposition of nitrogen, including background or measured deposition as well as predicted impacts of proposed future actions (Fox et al. 1989). Comparisons of predicted deposition levels with each threshold discussed show that deposition rates are predicted to be within the recommended cumulative range across all Class I and Class II areas analyzed. The comparison against BLM deposition thresholds in **Table 4A.2-6** includes current measured deposition rates from Great Basin National Park (accounting for the impacts of all existing sources), plus the projected impacts of the proposed EEC each modeled location, but does not include the impacts of any potential sources of nitrogen or sulfur compounds from source not operating during the monitoring period at Great Basin National Park. The National Park Service notes that acid neutralization capacity of soils in Great Basin National Park was studied in 1989 (reference EPA National Surface Water Survey, 1989). Those studies indicate that the soils in Great Basin National Park were found to be acid-sensitive (Acid Neutralization Capacity (ANC) of soils there of less than 200 microequivalents per liter). Current measured wet deposition rates at Great Basin National Park are approximately 1.35 kg/ha-yr. The Proposed Action would be predicted to raise wet deposition rates to just under 1.40 kg/ha-yr. The National Park Service notes that adverse impacts were noted in high mountain lakes at Rocky Mountain National Park when wet deposition of nitrogen reached 1.4 to 1.6 kg/ha-yr, so that nitrogen deposition increases predicted with this Proposed Action could bring the natural buffering capacity of the Great Basin National Park high mountain lake ecosystem to its capacity (NPS 2008).

The impact of the deposition of numerous compounds closer to the plant site was assessed through the application of a risk assessment model, which also included assessment of human and ecological risk from inhalation and all other exposure pathways.

TABLE 4A.2-6. SOUTH PLANT SITE CLASS I AREA MODELED DEPOSITION RATES

DEPOSITION PARAMETER	AVERAGING PERIOD	MODELED DEPOSITION FOR METEOROLOGICAL YEAR (KG/HECTARE/YR)			MEASURED BACKGROUND DEPOSITION RATES	MAX. TOTAL DEP.	BLM TOTAL DEPOSITION THRESHOLD
		2002	2003	2004			
JARBIDGE WA (CLASS I)							
Nitrogen	Annual	0.001	0.002	0.003	2.14	2.143	3.0
Sulfur	Annual	0.002	0.004	0.006	0.76	0.766	5.0
ZION NP (CLASS I)							
Nitrogen	Annual	0.001	0.001	0.002	2.14	2.142	3.0
Sulfur	Annual	0.003	.003	0.003	0.76	0.763	5.0

DEPOSITION PARAMETER	AVERAGING PERIOD	MODELED DEPOSITION FOR METEOROLOGICAL YEAR (KG/HECTARE/YR)			MEASURED BACKGROUND DEPOSITION RATES	MAX. TOTAL DEP.	BLM TOTAL DEPOSITION THRESHOLD
		2002	2003	2004			
GREAT BASIN NP (CLASS II)							
Nitrogen	Annual	0.042	0.039	0.031	2.14	2.182	3.0
Sulfur	Annual	0.085	0.076	0.064	0.76	0.845	5.0
RUBY LAKE NWR (CLASS II)							
Nitrogen	Annual	0.003	0.004	0.006	2.14	2.146	3.0
Sulfur	Annual	0.009	0.010	0.014	0.76	0.774	5.0

NA - Not applicable

Risk Assessment

Background and General Methodology

The risk assessment was performed in accordance with guidance provided by the EPA in "Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities" (HHRAP; EPA 2005a) and "Screening-Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities" (SLERAP; EPA 1999). The first step in both protocols is the establishment of a discrete list of chemicals of potential concern (COPCs) associated with the plant site, in this case the plant site boilers. This list was developed based on the list of non-criteria pollutants in EPA AP-42, "Fifth Edition, Compilation of Air Pollutant Emission Factors for Stationary Point and Area Sources" (EPA 1988). EPA AP-42 compiles information available from literature reviews and emissions data to identify emission factors of all applicable pollutants for various source types under a range of conditions. In general, COPCs included polychlorinated dibenzo(p)dioxins (PCDD), polychlorinated dibenzofurans (PCDF), polycyclic aromatic hydrocarbons (PAH), volatile organic compounds (VOC), and metals. COPCs considered for this risk assessment are provided in **Table 4A.2-7**.

TABLE 4A.2-7. COPCS FOR EEC BOILER EMISSION SOURCES

PCDD/PCDF	HAP	ORGANIC HAP'S	INORGANIC HAP'S
Total TCDD	Acenaphthene	Acetaldehyde	Antimony
Total PeCDD	Acenaphthylene	Acetophenone	Arsenic
Total HxCDD	Anthracene	Acrolein	Beryllium
Total HpCDD	Benzo(a)anthracene	Benzene	Cadmium
Total OCDD	Benzo(a)pyrene	Benzyl chloride	Chromium
Total PCDD	Benzo(b,j,k)fluoranthene	Biphenyl	Chromium(VI)
Total TCDF	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate (DEHP)	Cobalt
Total PeCDF	Chrysene	Bromoform	Copper
Total HxCDF	Fluoranthene	Carbon disulfide	Hydrogen chloride
Total HpCDF	Fluorene	2-Chloroacetophenone	Hydrogen fluoride
Total	Indeno(1,2,3-cd)pyrene	Chlorobenzene	Lead

PCDD/PCDF	HAP	ORGANIC HAP'S	INORGANIC HAP'S
OCDF			
Total PCDF	5-Methyl chrysene	Chloroform	Manganese
	Phenanthrene	Cumene	Mercury
	Pyrene	Cyanide	Nickel
		Dimethyl sulfate	Selenium
		2,4-Dinitrotoluene	Zinc
		Ethyl benzene	
		Ethyl chloride	
		Ethylene dichloride	
		Ethylene dibromide	
		Formaldehyde	
		Hexane	
		Isophorone	
		Methyl bromide	
		Methyl chloride	
		Methyl ethyl ketone	
		Methyl hydrazine	
		Methyl methacrylate	
		Methyl tert butyl ether	
		Methylene chloride	
		Naphthalene	
		Phenol	
		Propionaldehyde	
		Styrene	
		Tetrachloroethylene	
		Toluene	
		1,1,1-Trichloroethane (Methyl chloroform)	
		Vinyl acetate	
		Xylenes	

Source: Tables 2-1 and 2-2 (Tetra Tech 2008a)

Emission rates for most COPCs were calculated using engineering design specifications and standard emission calculation equations as specified in EPA's AP-42. Emission rates for mercury, hydrogen chloride, and hydrogen fluoride are specific to the EEC boilers, based on engineering design criteria particular to the EEC. All COPCs and emission rates for the EEC are provided in Appendices A-2 and A-3 of Tetra Tech (2008a). COPCs and emission rates are the same for both the South Plant Site and the North Plant Site.

In order to characterize potential dispersion and downwind impacts caused by emissions of COPCs, the American Meteorological Society/EPA Regulatory Model Improvement Committee Dispersion Model "AERMOD" was employed. Use of AERMOD is consistent with both EPA

modeling guidance (EPA 2005b) and NDEP modeling guidance (NDEP 2006). The AERMOD system involves the integration of terrain preprocessing, meteorological data preprocessing, and air dispersion modeling algorithms, resulting in predictive unit concentrations in ambient air from emissions in the form of particulates, vapors, and vapors condensed onto the surface of particles (i.e., particle-bound). The model receptor grid was grouped into the following four categories in order to obtain the necessary density and coverage as specified in EPA (2005a):

- Fence line at 25-meter intervals around the EEC plant site
- 100-meter receptor spacing out to 2 kilometers in all directions from the center of the plant site
- 500-meter receptor spacing between 4 and 8 kilometers from the plant site
- 1,000-meter receptor spacing between 8 and 50 kilometers from the plant site

Receptor grids were scaled to 50 kilometers from each of the plant sites because impacts were expected to be greatest within this distance. Air dispersion modeling conducted for the EEC air permit application shows that concentrations of pollutants, including COPCs, peak well within that modeled range, and drop off to continually lower levels further away from the proposed EEC plant sites. Therefore, risks beyond the modeled 50 kilometer range would be lower than the maximum risks documented within that range. The total number of grid receptor locations is 12,816 for the South Plant Site. Those receptor grids are the same ones used in the Class II Direct Impact Area air quality modeling analyses discussed earlier. Five years of meteorological data from the Ely Yelland Field NWS weather station were used to drive the atmospheric dispersion for the Risk Assessment analyses. Output from the AERMOD modeling was subsequently used as input for both the HHRA and ERA.

Human Health Risk Assessment Methodology

Land use and demographic studies were prepared to define environmental conditions for the air dispersion model, and to verify potentially affected receptors (people) and the potential intake pathways based upon local lifestyles (Tetra Tech 2008a). Vegetation studies showed the lower elevations featured shrub-steppe habitat dominated by sagebrush in the lower elevations, changing over to pinyon – juniper in mid elevations and then to Douglas Fir – and White Fir in the uplands. In developed areas, alfalfa, grown primarily for livestock feed, is the most common crop within 50 km of the plant site. Beef cattle and sheep are the primary livestock raised in the area. Dairy cattle are not raised commercially, though ranchers may raise some for personal use. The United States Census Bureau (USCB) showed a population of 8,259 within 50km of the South Plant Site in 2000. Eighty percent of those people resided in five locations: Ely, McGill, Ruth, on the Shoshone reservation, or in the Ely State Prison. That census data showed the population as 90 percent white, equally split by gender without the prison population and 55 percent male, 45 percent female including the prison population. The remaining population resides in unincorporated portions of White Pine County. **Table 4A.2-8** documents the sensitive subpopulations (medical facilities, schools, or areas where children congregate) in the vicinity of the South Plant Site where special receptors were identified in the vicinity.

TABLE 4A.2-8. SENSITIVE SUBPOPULATIONS IDENTIFIED IN THE VICINITY OF THE SOUTH PLANT SITE

FACILITY NAME AND ADDRESS	FACILITY TYPE	APPROXIMATE DISTANCE FROM SOUTH PLANT SITE (KILOMETERS)
Little Peoples Headstart 435S. 13th St., Ely	Preschool / day care Enrollment 75	16
Magic Carpet Preschool 108 Mineral Drive, Ely	Preschool / kindergarten Enrollment 100	16
Mountain View Elementary 1001 11th St. E, Ely	Pre-kindergarten through grade 5 Enrollment 471	16
White Pine Middle School 616 High St., Ely	Grades 6 through 8 Enrollment 319	16
White Pine High School 844 Aultman St., Ely	Grades 9 through 12 Enrollment 387	16
Nova Center 700 Aultman St., Ely	Grades 9 through 12 Enrollment 21	16
McGill Grade School 25 F Avenue, McGill	Kindergarten through grade 5 Enrollment 129	11
William B. Ririe Hospital 1500 Avenue H, Ely	25 bed hospital	16
Ely Mental Health Center 1675 Aultman St., Ely	Outpatient medical services	16
White Pine Care Center 1500 Avenue G, Ely	99 bed nursing home	16

Because the population within the 10 kilometers EPA recommends as adequate for human exposure studies is limited to just a few isolated ranches, the HHRA study considered all receptors out to the 50 kilometer extent to which EPA recommends the air dispersion model AERMOD. On the basis of the demographic information identified, consistent with EPA's HHRAP (EPA 2005a) guidance with the exception of the broader impact area based upon low population density, the HHRA identified the following conservative receptors as representative of worst-case assumptions for potential human exposure to COPCs released from the plant site:

- Adult subsistence farmer and children on that farm
- Adult and child residents
- Adult subsistence fisherman and children of that family

Risks to hunters from wild game were not assessed directly because EPA provides no guidance for this exposure pathway, but the HHRA study documented that the subsistence farmer risk assessment scenario considers COPC intake in higher volumes than could be expected for a hunter.

All exposure pathways recommended in EPA HHRA guidance were evaluated. The primary risk exposure pathways included:

- Inhalation of vapors and particulates
- Incidental ingestion of soil
- Drinking water from surface water sources
    - Because all area drinking water comes from wells, this pathway was limited to intake while swimming in Schoolhouse Spring near McGill

- The City of Ruth draws its drinking water from Lion Spring, which was not considered a surface water because the vast majority of the flow is not exposed to the surface

- Eating home-grown produce,
- Ingesting local livestock products (including beef, chicken, pork, milk, and eggs), and
- For infants, ingesting breast milk

Risk estimates included conservative exposure rates including constant exposure to inhalation, percentage of diet represented by potentially affected water, produce or livestock product and duration on that diet. COPC toxicity ratings and risks utilized in the HHRA followed EPA guidance, and included data from the EPA 2007 Integrated Risk Information System (IRIS), EPA's 2004 Provisional Peer reviewed Toxicity Values, 2003 California Environmental Protection Agency toxicity values, and 2005 Agency for Toxic Substances and disease registry Minimal Risk Levels.

Human risks were calculated for each receptor using the EPA generic formula for COPC intakes;

$$I = (C_{gen})(CR)(EF)(ED))/(BW)(AT)$$

where: I = intake, the amount of the COPC
C_{gen} = generic concentration of the COPC in the medium (for example, mg /L of water)
CR = consumption rate (for example, volume of water intake per day)
EF = exposure frequency (days per year)
ED = exposure duration (years)
BW = average body weight over the duration
AT = averaging time

Intake or exposure rates are calculated for the average daily dose (ADD) using AT= (EF)(ED) or exposure frequency multiplied by the exposure duration, and lifetime average daily does (LADD) assuming AT = 70 years of continuous exposure. Human risks for carcinogens were calculated by multiplying the calculated LADD for each COPC by the unit risk factor for that compound for that exposure pathway, generating a lifetime excess cancer risk. If more than one pathway exists for a COPC, then the risk for that COPC is the sum of the risks for each individual pathway. The resulting calculated risk is expressed as a probability, for example as $1x10^{-6}$, or one in a million exposed people. The cumulative acute hazard risk to a receptor (individual) is calculated as the sum of the individual risks associated with the exposure pathways identified for each COPC they are exposed to. Risks for non-carcinogens are similarly calculated by multiplying the ADD times the risk factor. The cumulative risk to a receptor (individual) is calculated as the sum of the individual risks associated with the exposure pathways identified. The cumulative risks for human receptors are compared against a threshold of $1x10^{-5}$ (1 in 100,000) and a target of $1x10^{-6}$ (1 in 1,000,000). Two other risk calculations were also made. The Acute Hazard Quotient (AHQ) was calculated based upon maximum model predicted one-hour exposure and compared against a safety threshold of 1. Infant exposure to COPCs through breast milk was also calculated, with the ADD_{infant} compared against the low daily max safety threshold of 93 pg/kg.

Risk calculations for the subsistent farmer scenario used receptors in the Steptoe and Spring Valleys. Ranches specifically included were the Bews, Borchert, D. Henroid, Foppiano, J. Henroid, Johnson, Lambert, Luscetti, Mattier, Pescio, Pierce, Roselund, Salvi, Schellbourne,

Schellbourne Station, and Steptoe Ranches. Residential receptors specifically studied include the nearer of the listed ranches as well as residents of Ely and East Ely, McGill, the Ely State prison, the Ely Shoshone Tribe, and residents in the Ely Yelland Field area. Subsistence fisherman and their families were assumed to eat fish from Duck Creek and Bassett Lake, the closest lake to the plant site. Direct inhalation risks were calculated at the nearer residential areas listed, and also conservatively at the plant site fence line, and the agricultural use area with the highest predicted air concentrations. Native American receptors were assumed to have more exposure to soils due to their subsistence lifestyles.

Local measured data were used to estimate precipitation rates, as well as evaporation and water usage rates from local water bodies. Drainage size, erosion potential, and soil characteristics were included in analyses of anticipated runoff as well as sediment and COPCs delivered through waterways to the water bodies studied.

Ecological Risk Assessment Methodology

The SLERA followed the EPA (1998) *Guidelines for Ecological Risk Assessment* and used the screening approach in the *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 1999) to assess whether emissions from the proposed facility would adversely affect ecological receptors. The SLERA was performed to identify potential adverse ecological impacts of hazardous COPCs emitted from the plant site based on the evaluation of exposures by species that inhabit Steptoe Valley and mountainous areas on the east and west sides of the valley, and it is based on the worst-case assumption of concurrent operation of all boilers (two main boilers plus the auxiliary boiler) at each location. A risk assessment for cumulative effects of the EEC and WPES can be found in **Section 5.6** of the DEIS.

The SLERA evaluated both direct and indirect exposures: (1) the direct inhalation exposure estimates are based on the highest annual average air concentrations of COPCs, and (2) the indirect exposure estimates are based on the deposition and accumulation of COPCs for 30 years and assumes that receptors are exposed to the highest COPC concentrations in the environment (that is, the concentrations that have built up after 30 years). COPCs evaluated in the SLERA included both the EEC hazardous air pollutants (HAPs) listed in the SLERAP (EPA 1999) as well as other HAPs that are not listed in SLERAP but where a full set of parameters (fate, transport, exposure, and toxicity) was available for one or more receptors. The COPCs evaluated in the SLERA are shown in **Table 4A.2-9**.

TABLE 4A.2-9. COMPOUNDS EVALUATED IN THE EEC SLERA

SLERAP COPC'S		NON-SLERAP COPC'S	
ORGANICS	**INORGANICS**	**ORGANICS**	**INORGANICS**
Dioxins[1]	Antimony	Acenaphthylene	Cobalt
Benzo(a)anthracene	Arsenic	Benzo(g,h,i)perylene	Uranium
Benzo(a)pyrene	Beryllium	Biphenyl	
Benzo(b)fluoranthene	Cadmium	Ethylene dichloride[3]	
Benzo(k)fluoranthene	Chromium	Hexane	
Chrysene	Lead	5-Methylchrysene	
Indeno(1,2,3-cd)pyrene	Mercury	1,1,1-Trichloroethane[2]	
DEHP	Nickel	Carbon disulfide[2]	
Chloroform	Selenium	Chlorobenzene[2]	
Cumene (1,4-dioxane)		Chloroform[2]	
2,4-Dinitrotoluene		Ethyl benzene[2]	
Formaldehyde		Ethylene dibromide[2]	
		Fluorene[2]	
		Methyl tert-butyl ether[2]	
		Methylene chloride[2]	
		Naphthalene[2]	
		Phenanthrene[2]	
		Styrene[2]	
		Tetrachloroethylene[2]	
		Toluene[2]	
		Xylene[2]	

[1] Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans; evaluated as homologues
[2] Evaluated for inhalation risk only
[3] Evaluated for inhalation risk and SLERAP food webs
Source: Table 5-1 (Tetra Tech 2008a)

The SLERA results were used to evaluate the level of impacts (negligible, low, moderate, or high) to ecological communities, characteristic of the Central Basin and Range ecosystem, including shrub-steppe, montane, and aquatic environments. Ecological receptors, organisms that are known or expected to inhabit the environments around the emission facilities, were selected for the shrub-steppe and montane habitats based on data regarding Great Basin species as compiled by the World Wildlife Fund (2006) and on the research for the ERA conducted for Hawthorne Army Depot, a facility located approximately 120 miles west of Steptoe Valley but in the same ecoregion (Tetra Tech 2005). Tetra Tech (2008a) also consulted with NDOW regarding receptors that would forage and hunt at water bodies in the assessment areas (including Bassett Lake and Duck Creek) and with NNHP regarding threatened or endangered species that would occur in the area. The ecological receptor list was developed and refined based on these consultations. Receptors, which represent the point of direct impact,

appropriate for the potentially exposed ecological communities were then organized into discrete food webs for the shrub-steppe, montane, and aquatic environments.

Food webs, which are required in order to evaluate indirect exposures, were developed for the shrub-steppe, montane, and aquatic habitats in accordance with EPA (1999) guidance based on available information about the ecology of the area and receptors expected to forage or hunt in the area. Each food web includes plant and animal communities (that represent forage), and mammals and birds, organized by feeding guild, linked through all potential dietary (indirect exposure) relationships. Food webs include those trophic stages in which exposure and bioaccumulation of COPC's may occur. For example, the aquatic food web structure includes the initial uptake trophic level of water and sediment, followed by rooted plants, then herbivorous birds and mammals and benthic invertebrates, then omnivorous mammals and aquatic birds, and finally raptors and piscivorous birds (as the top predator trophic level). These food webs address the indirect exposure pathway where COPC concentration increases with trophic level. Food web development and modeling also addresses the potential temporal build-up of COPC concentration across a 30-year time span. Food web organization is shown in Figures 5-3, 5-4, and 5-5 of Tetra Tech (2008a). It should be noted that reptiles and amphibians are not included because toxicological information for them is insufficient (EPA 1999).

Assessment endpoints represent the type of impact that may occur if the results of the SLERA indicate a measurement receptor may be at risk, and it is the valued attribute of an ecological receptor that was evaluated by the SLERA (EPA 1999). Valued attributes are required to sustain function of an ecosystem, provide resources, or are perceived as valuable by humans. Specific assessment endpoints for the EEC ERA are provided in Tables 5-3 through 5-5 in Tetra Tech (2008a).

Measurement receptors, or representative receptors for each mammal and bird feeding guild in each food web, were selected to quantitatively evaluate risks to mammalian and avian populations in the assessment areas. These receptors were selected based on ecological relevance, known presence in the area, importance in the food web, and availability of natural history information. Terrestrial receptors evaluated as communities included plants and soil invertebrates, while aquatic receptors evaluated as communities included benthic invertebrates and aquatic life (includes fish, plankton, larval amphibians, algae, and other organisms living in the water column). State- and federally-listed aquatic snails (*Pyrgulopsis spp.*) were also evaluated as measurement receptors independently (see *Risks to Special Status Species*).

In the shrub-steppe habitat, the following measurement receptors were evaluated (Tetra Tech 2008a):

- Herbivorous birds – Sage grouse (*Centrocercus urophasianus*). The grouse is used to measure risks to birds that subsist on leaves, grass, seeds, pine needles, berries, and other plant matter. Other herbivorous birds in this habitat include the ruffed grouse, California quail, and many species of passiformes such as the purple finch and American goldfinch.
- Herbivorous mammals – Fletcher's dark kangaroo mouse (*Microdipodops megacephalus nasutus*). The mouse is used to measure risks to mammals that forage and browse chiefly on plant matter such as forbs, grass, seeds, and leaves. Other receptors in this feeding guild include the several species of rabbit; small mammals such as Merriam's kangaroo rat, desert pocket mouse and long-tailed pocket mouse; and large mammals such as the pronghorn antelope and the elk.

- Omnivorous birds – American robin (*Turdus migratorius*). Omnivorous receptors consume both plant and animal matter; often one type of food is targeted seasonally. In addition to the robin, the habitat supports other thrushes, hummingbirds, cedar waxwing, and many other omnivores. By assuming that the robin eats only invertebrates, this measurement receptor is also used to evaluate aerial insectivores, such as the white-throated swift.
- Insectivorous mammals – Merriam's shrew (*Sorex merrianmi*). The shrew represents animals that are chiefly insectivorous, which include several other shrews and several bats that inhabit the shrub-steppe habitat. Ground-feeding shrews forage for insects, earthworms, and arthropods, and bats, such as the big brown bat, eat both surface-dwelling invertebrates like beetles and flying insects such as moths and wasps.
- Carnivorous mammals – Coyote (*Canis latrans*). The coyote is used to measure risks to mammalian predators that hunt in the shrub-steppe habitat. Other carnivores include gray fox, red fox, American marten, long-tailed weasel, ermine, and several cat species.
- Raptors – Red-tailed hawk (*Buteo jamaicensis*). This hawk is used to measure risks to birds of prey that hunt in the shrub-steppe habitat, which include many other hawks such as Cooper's hawk and sharp-shinned hawk; several species of owls; and several species of falcons.

The rationale for measurement receptor selection of the mouse is such that the mouse has a high exposure potential because of its high metabolic rate and, therefore, its normalized food ingestion rate is relatively high compared with other mammals. Also, it represents the small rodent prey base for many carnivores, as do the birds and shrew. The birds are important in representing seed dispersal in the environment, and the sage grouse also represents birds that are important game species. The coyote and hawk represent the top predators that help regulate prey populations.

In the montane habitat, the following measurement receptors were evaluated (Tetra Tech 2008a):

- Herbivorous birds – Chukar (*Alectoris chukar*). The chukar is used to measure risks to birds that subsist on forbs, seeds, pine needles, berries, and other plant matter. Other herbivorous birds in this habitat include sage grouse and passiformes such as Cassin's finch and American goldfinch.
- Herbivorous mammals – Mountain cottontail (*Sylvilagus nuttallii*). The mountain cottontail is used to measure risks to mammals that forage and browse chiefly on plant matter such as forbs, grass, seeds, and leaves. Other receptors in this feeding guild include other small mammals such as the desert pocket mouse, marmot, and pika; and large mammals such as the mule deer and elk.
- Omnivorous birds – American robin. Omnivorous receptors consume both plant and animal matter; often one type of food is targeted seasonally. In addition to the robin, this habitat supports many of the same ground-feeding and aerial omnivores as the shrub-steppe habitat.
- Omnivorous mammals – Least chipmunk (*Eutamias minimus*). The chipmunk represents mammals that have an omnivorous feeding strategy, such as the raccoon, as well as mammals that are chiefly insectivorous, which include shrews and bats.

- Carnivorous mammals – Long-tailed weasel (*Mustela frenata*). This species of weasel is used to measure risks to mammalian predators that hunt in the montane habitat. Other carnivores include gray fox, red fox, coyote, and ermine.
- Raptors – Red-tailed hawk. This hawk is used to measure risks to birds of prey that hunt in the mountains, which include this hawk as well as others, several owls, and several falcon species.

In the montane habitat, the chukar represents a valued game species and prey species. The cottontail is an important prey species for raptors and is considered as a surrogate for the pygmy rabbit, and special-status species. The chipmunk and robin represent the prey base for the weasel and hawk.

For the aquatic habitat evaluated at Bassett Lake, Duck Creek, McGill Spring, and Schoolhouse Spring, the following measurement receptors were utilized (Tetra Tech 2008a):

- Herbivorous mammals – American beaver (*Castor canadensis*). The beaver is the principal semi-aquatic mammal that is expected to subsist exclusively on vegetation in aquatic environments in the assessment area.
- Herbivorous birds – Canada goose (*Branta canadensis*). The Canada goose is a semi-aquatic bird that represents birds, such as the marsh wren, for which vegetation is their principal diet.
- Omnivorous birds – Mallard (*Anas platyrhyncos*). The mallard represents semi-aquatic omnivorous birds, such as the sandpiper, pintail, teal, gadwall, and gulls. The evaluation of the benthic invertebrate pathway also considers birds like the sandpiper and white-faced ibis that feed on small animals living in the sediment.
- Omnivorous mammals – Muskrat (*Ondrata zibethicus*). The muskrat consumes aquatic vegetation and invertebrates such as bivalves. The raccoon is the other principal omnivore that may feed from shores in aquatic environments.
- Piscivorous birds – Great blue heron (*Ardea herodeas*). The great blue heron represents birds for which fish is a principal dietary component, which include the American white pelican, golden eagle, and other herons.
- Raptors – Red-tailed hawk. Many hawks would be expected to hunt for semi-aquatic animals. The red-tailed hawk is used to measure risks to these other birds of prey, which include other hawks and several falcon species.

The beaver was selected since it is a large, semi-aquatic rodent valued for its fur, while the muskrat is also an important fur-bearer. The Canada goose is responsible for regulating populations of algae, while the mallard feeds on both plants and invertebrates and is a game species. The great blue heron is a top predator subsisting solely on fish, while the hawk is representative of a top predator that may prey on fish, semi-aquatic birds, and semi-aquatic mammals.

In order to quantify estimated exposure levels (EELs) for receptors evaluated in the SLERA, an exposure assessment was conducted. The exposure assessment included all direct uptake pathways of a COPC from media (soil, sediment, and surface water) for lower trophic level receptors evaluated at the community level, and ingestion of a COPC-contaminated organism (plant or animal food item) or media for higher trophic level receptors evaluated as class-specific guilds (Tetra Tech 2008a). Media concentrations of COPCs were calculated using the media

concentration equations in the SLERAP, and values for fate and transport parameters used in the equations were taken from the EPA HHRAP (2005a). Parameter values for non-SLERAP COPCs were established following the procedures presented in the SLERAP. Measures of exposure for media communities (benthic and soil invertebrates, aquatic life, and terrestrial plant communities) were calculated using the media estimation equations and recommended fate and transport parameter values in the EPA HHRAP (2005a), which represents the most current equations and parameter values recommended by EPA for incineration risk assessments. COPC concentrations in soil were averaged over the shrub-steppe and montane habitats in the assessment areas based on knowledge that receptors forage and hunt over large areas, particularly in arid environments. In addition, concentrations of COPCs in soil in habitat around Bassett Lake and Duck Creek were also estimated to evaluate exposures to wildlife that tend to congregate around water bodies. Concentrations in surface water and sediment for Bassett Lake, Duck Creek, McGill Spring, and Schoolhouse Spring were also calculated following EPA (2005a) guidance, with the waterbody and watershed areas defined based on visual inspection of a USGS topographic map.

Inhalation exposure, which is not covered in the SLERAP (EPA 1999), was also evaluated for mammals because inhalation toxicity reference values (for this taxon only) have recently been developed and used in EPA Region 9. Ingestion exposure and hazard were calculated with Version 2.6 of the "EcoRisk View" program (Lakes Environmental Software, Inc. 2001), which was designed to explicitly follow EPA's SLERAP (EPA 1999). Emission estimates and air modeling results were used as inputs to EcoRisk View, and calculations were performed for each source, COPC, pathway, and receptor (Tetra Tech 2008a).

Four conservative assumptions regarding the exposure assessment methodology were employed (Tetra Tech 2008a):

- A receptor was assumed to forage and hunt to fulfill all nutritional needs in the habitats evaluated. It is known that migratory birds that use surface water bodies in the assessment areas are not year-round residents and, when they are in the area, they do not exclusively forage and hunt at a specific water body. Still, it was assumed that they are year-round residents because the proportion of time they forage and hunt at the water bodies is uncertain.
- COPC bioavailability was assumed to be 100 percent – that is, all of the COPC a receptor is exposed to is assumed to interact at the site of toxic action, either through ingestion and uptake across the gut, through inhalation and uptake by the lungs, or through direct contact in soil, surface water, and sediment.
- Although exposures (and effects) will be distributed within a population based on the distribution of age classes, it was assumed that the exposure occurs only for the most sensitive life stage for sufficient duration and intensity because age class information about the receptors is not available.
- The SLERAP exposure assessment methods for estimating COPC transfer in terrestrial food chain pathways are based on the aquatic food chain pathways. Although empirical evidence indicates that lipophilic substances biomagnify in aquatic ecosystems, resulting in high doses to predators, biomagnifications in terrestrial pathways occurs to a lesser extent.

Toxicity reference values (TRVs), or the measures of effect for media communities exposed through direct contact and measurement receptors exposed through ingestion, for SLERAP

COPCs were provided in Appendix E of EPA (1999). For non-SLERAP COPCs, TRVs were identified according to the procedures outlined in the SLERAP and are provided in Table 5-9 of Tetra Tech (2008a).

The magnitude of risk was characterized by calculating COPC-specific hazard quotients (HQs) for each receptor evaluated for each food web, where HQ = EEL/TRV. Subsequently, hazard indices (HIs) were calculated for each receptor and emission source by summing COPC-specific HQ values. An HQ value that exceeds 1 indicates the potential for a receptor to be adversely affected by a COPC, and an HI value that exceeds 1 indicates that emissions from one or more emission sources could adversely affect a receptor (EPA 1999).

4A.2.2 Direct and Indirect Effects on Air Quality from Electric Transmission Facilities

Construction

Total acreage for earthmoving activities for the transmission line construction project duration of nine months for the EEC-RS or alternative EEC-HA routing via Segment 4A to Segment 1D to Robinson Summit is estimated to be approximately 9,400 acres. The Segment 3 alternative would be a comparable length and cover comparable acreage. Using an emissions factor of 0.11 ton/acre/month and assuming 10 percent of the acreage experiencing active earthmoving at any one time, the total PM_{10} emissions are estimated to be 930 tons. This assumes watering of the earthmoving areas several times each day for dust control. Though cumulative emissions would be high, they would be spread out over hundreds of miles and over months of construction. Impacts would be brief, temporary, and likely small in magnitude at all residences because of their setback from the construction locations.

Operations, Maintenance, and Abandonment

Reclamation of impacts during construction would reduce the acreage of disturbed ground along transmission lines created during the construction phase to approximately 1,100 acres under the Proposed Action, and to a comparable acreage under the alternative Segment 3 routing. That would reduce the areas along the transmission lines where soil disturbance could result in dust generation by approximately 88 percent cumulatively as the project becomes operational. Isolated impacts from dust could persist near the remaining areas where transmission corridors would feature soil disturbances. Operation, maintenance, and potential abandonment of the electrical transmission power systems would have negligible impacts on air quality.

4A.2.3 Direct and Indirect Effects on Air Quality from Water Supply Facilities

Construction

Water wells would be constructed to supply the operations. Under the Proposed Action, it is expected that well preparation and pipelines within the Lages Station Well Field and for a water supply line to the plant site would be result in approximately 1,200 acres of disturbed ground during construction. Total disturbed acreage is expected to be approximately 1,200 acres for a duration of six months. The alternative or supplemental well fields would be along the pipeline, though the Middle Well Field would be north of the South Plant Site. The emission factor for water supply line construction is 0.42 tons/acre/month for active disturbance by earth moving equipment (WRAP 2006). Assuming 30 percent of the total pipeline ROW area is under active construction at one time, the total PM_{10} emissions are estimated to be 907 tons.

Operations, Maintenance, and Abandonment

Reclamation of construction impacts would reduce the extent of disturbed ground along the water pipeline created during the construction phase to a 60 foot width. That would reduce dust generation approximately 50 percent (compared to if the total disturbed area was not

reclaimed). Low intensity impacts from dust could persist near the remaining non-reclaimed areas where the water line facilities would feature soil disturbances.

4A.2.4 Direct and Indirect Effects on Air Quality from Rail Facilities

Construction

Construction of the rail lead from the NNRy to the South Plant Site would result in disturbance to 55 acres generating approximately 14.5 tons of PM_{10} over a 24-month period.

Regarding the Alternative Rail Line, it is estimated that railroad construction would be approximately 100 miles long for a duration of 24 months. The total amount of disturbed ground, to the South Plant Site, including the collocated water line from Lages Station south, would be approximately 3,000 acres. It is assumed that 10 percent of the ROW would be disturbed by active earth moving equipment at any one time. With an emission factor of 0.11 tons/acre/month, the PM_{10} emissions for the 24-month period is estimated to be 808 tons PM_{10}.

Operations, Maintenance, and Abandonment

The Proposed Action would represent the return of train traffic through the valley discontinued in the late 1980s. It would result in regular train traffic along an approximately 102-mile route from Shafter to the South Plant Site, including the rail lead to the site. The NNRy impacts would be slightly higher than those for the Alternative Rail Line because the rail line, including the rail lead, would be a couple of miles longer. Emissions from train engine exhaust and coal loading and unloading on-site were included in the emissions and impact analysis for the EEC in the air permit application for this DEIS, but offsite engine exhaust emissions along the rail line were not included in that quantitative impact analysis. When operating at full capacity, the EEC would require approximately 1.4 – 135-car coal train round trips per day, with five engines pulling full loads south and empty loads when returning back north. It is conservatively assumed that up to one two-engine trains per day would be required to transport other supplies needed at the plant site. The annual air pollutant emissions from the diesel train engines exhaust between Shafter and the South Plant Site with the EEC operating at maximum capacity were estimated to be 27.2 tons of VOCs, 108.7 tons of CO, 365.5 tons of NO_x, 28.8 tons of SO_2, and 22.2 tons of PM_{10}. Brief locomotive exhaust air quality impacts are estimated to extend up to a few hundred yards from the train tracks when each train passes.

The train traffic rate using the Alternative Rail Line would equal that described for the NNRy. Overall emissions for this alternative would be slightly lower than with NNRy rail service because the Alternative Rail Line would be approximately two miles shorter than the NNRy rail line and its lead to the project site. This would represent the return of train traffic through the valley discontinued in the late 1980s, along a new rail line east of the previous NNRy. Emissions from train engine exhaust and coal loading and unloading on-site were included in the emissions and impact analysis for the EEC in the air permit application and this DEIS, but offsite engine exhaust emissions along the rail line were not included in that quantitative impact analysis. When operating at full capacity, the EEC would require approximately 1.4 – 135-car coal train round trips per day, with five engines pulling full loads south and empty loads when returning back north. It is conservatively assumed that up to one two-engine trains per day would be required to transport other supplies needed at the plant site. The annual air pollutant emissions from the diesel train engines exhaust between Shafter and the plant site with the plant site operating at maximum capacity were estimated to be 26.6 tons of VOCs, 106.6 tons of CO, 358.5 tons of NO_x, 28.3 tons of SO_2, and 21.8 tons of PM_{10}.

Each train passage at any one location is estimated to take five minutes along the open line, longer near or along the rail spur to the plant site because the speed would be slower.

4A.3 North Plant Site Alternative

4A.3.1 Direct and Indirect Effects on Air Quality from Plant Site

Construction

Emissions would be the same as reported for the Proposed Action with the exception of employee commute distance, and the shift in location of the activities to the North Plant Site.

Total employee traveling distance would be 18 miles per day (round trip) during power plant construction from the associated worker village, an increase of 10 miles over the Proposed Action. For the 60-month construction period, the vehicle emissions were estimated to be 0.94 tons of VOC, 9.7 tons of CO, 0.78 tons of NOx, 0.02 tons of PM_{10}, and 0.01 tons of SO_2.

The total North Plant Site construction vehicle and construction equipment tailpipe emissions were estimated to be 188 tons of VOC, 1,043 tons of CO, 3,531 tons of NOx, 171 tons of PM_{10}, and 3.1 tons of SO_2.

In addition to tailpipe vehicular emissions by worker commute, fugitive PM_{10} emissions would occur from re-entrained dust from road surfaces. The same assumptions regarding number of employees and use of ride sharing described above were used to estimate fugitive dust emissions. Emission factors were developed, and PM_{10} emissions were calculated. Emission factors for paved road travel were calculated based on an average vehicle weight of 2.5 tons and surface silt content of 8.5 percent. The paved road traveling distance is estimated to be 16 miles round trip per day. Emission factors for unpaved road travel were calculated based on a surface silt content of 18.4 percent, an average vehicle weight of 2.5 tons, and 90 mean days per year with 0.01 inch or more of precipitation. Travel over unpaved roads was estimated at 2 miles round trip per day. The maximum 60-month PM_{10} fugitive emissions resulting from employees commuting were estimated to be 74.1 tons.

Operations, Maintenance, and Abandonment

Emissions

HAP and CO_2 emissions would be the same as reported for the Proposed Action.

Criteria Air Pollutant emissions would also be the same as reported for the Proposed Action for all emission source categories except material handling, which made up less than ten percent of the particulate emissions and did not contribute to the emissions of any other pollutant. The differences in material handling emissions would be minimal. Those emissions, and the locomotive emissions, would be distributed spatially across the North Plant Site a little differently than they would be at the South Plant Site because of the L-shaped property associated with the North Plant Site alternative.

Employee Commuter Emissions

Tailpipe pollutants would be emitted from vehicles used by employees commuting to and from the associated worker village. Assuming 150 employees, four employees per vehicle, 18 miles round trip, and a seven day work week, the annual tailpipe emissions were estimated to be 0.31 tons of VOC, 3.3 tons of CO, 0.25 tons of NOx, 0.007 tons of PM_{10}, and 0.004 tons of SO_2.

In addition to tailpipe vehicular emissions by commuting workers, fugitive PM_{10} emissions would occur from re-entrained dust from road surfaces. The same assumptions used for the operations at the South Plant Site apply at the North Plant Site; except that the paved road traveling distance is estimated to be 16 miles round trip per day (unpaved roads remain at the estimated 2 miles round trip per day). The maximum annual PM_{10} fugitive emissions resulting from employees commuting were estimated to be 22 tons/year.

Ambient Air Quality Impacts

The facility's ambient air quality impacts under the North Plant Site alternative are documented in detail in the "Air Quality Impact Analysis" report prepared for Sierra Pacific Resources for submittal to the BLM by Tetra Tech EMI, Inc. That document describes the details by which the EEC meets all applicable ambient air quality impact limits under all project alternatives consistent with NDEP application of those requirements with the facility's permit application.

The predicted impacts of onsite plant site operations, including unloading and management of coal and supplies and the onsite ash disposal area, are summarized below in terms of potential impacts on: 1) Class I areas and FLM identified sensitive Class II areas, 2) Class II areas, 3) Visibility and Regional Haze, 4) Deposition of Nitrates and Sulfates, and 5) Risks to human and ecological health.

Class I Area and FLM Identified Sensitive Class II Area Impacts

The Class I area and sensitive Class II area modeling results are documented in **Table 4A.3-1**.

Because the predicted maximum SO_2 impacts exceeded the PSD SILs for the two Class I areas, a cumulative analysis of increment consumption since the baseline dates for PSD for SO_2 in the areas of those two areas was conducted consistent with NDEP requirements. The details of that cumulative SO_2 analysis are documented in **Section 5.6** of the DEIS.

As for the North Plant Site alternative, impacts for all pollutants but SO_2 would not reach significant contribution levels. Because the predicted maximum SO_2 impacts exceeded the significant contribution threshold for the two Class I areas, a cumulative analysis of increment consumption since the baseline dates for PSD for SO_2 was performed in the areas of those two areas. The details of that cumulative SO_2 analysis, which NDEP concurred show that cumulative SO_2 impacts in the Class I areas are well within incremental limits set in the PSD program, are documented in **Section 5.6** of the EIS.

TABLE 4A.3-1. NORTH PLANT SITE LONG-RANGE TRANSPORT PSD MODELING RESULTS

POLLUTANT	AVERAGING PERIOD	MODELED CONCENTRATION FOR METEOROLOGICAL YEAR (MG/M^3)			PSD SIL	PSD INCREMENT LIMIT
		2002	2003	2004	(μg/m^3)	(μg/m^3)
JARBIDGE WA (CLASS I)						
NO_2	Annual	0.0010	0.003	0.004	0.1	2.5
SO_2	3 hours	3.94	7.70	3.97	1.0	25
	24 hours	0.44	0.61	0.46	0.2	5
	Annual	0.01	0.01	0.02	0.1	8
PM_{10}	24 hours	0.28	0.25	0.20	0.3	8
	Annual	0.004	0.004	0.009	0.2	8
ZION NP (CLASS I)						
NO_2	Annual	0.001	0.001	0.001	0.1	2.5
SO_2	3 hours	1.65	1.38	1.02	1.0	25
	24 hours	0.28	0.15	0.12	0.2	8
	Annual	0.01	0.004	0.004	0.1	2
PM_{10}	24 hours	0.44	0.07	0.07	0.3	8
	Annual	0.004	0.003	0.003	0.2	8
GREAT BASIN NP (CLASS II)						
NO_2	Annual	0.07	0.02	0.03	1	25
SO_2	3 hours	11.65	9.07	10.64	25	512
	24 hours	1.03	1.06	1.09	5	91
	Annual	0.01	0.07	0.05	1	25
PM_{10}	24 hours	0.48	0.43	1.09	5	30
	Annual	0.03	0.02	0.02	1	17
RUBY LAKE NWR (CLASS II)						
NO_2	Annual	0.004	0.006	0.009	1	25
SO_2	3 hours	6.55	10.19	7.22	25	512
	24 hours	0.92	0.92	1.09	5	91
	Annual	0.02	0.02	0.03	1	25
PM_{10}	24 hours	0.66	0.54	1.09	5	30
	Annual	0.016	0.013	0.018	1	17

Class II Area Impacts

Shaded areas in **Figures 4.6-3** and **4.6-4** show the areas where maximum air quality impacts exceeding Class II SILs are predicted for NO_2, SO_2, and PM_{10}, respectively. Class II SILs for CO are not predicted to be exceeded. The maximum distances at which significant contributions to air pollutant levels were predicted from the North Plant Site extend from the property boundary are shown below in **Table 4A.3-2**.

TABLE 4A.3-2. MAXIMUM EXTENT OF PREDICTED SIGNIFICANT CONTRIBUTION TO AIR POLLUTANT LEVELS IN AND AROUND THE NORTH PLANT SITE

POLLUTANT	MAXIMUM EXTENT OF SIGNIFICANT CONTRIBUTION EEC METEOROLOGICAL DATA (KM)	MAXIMUM EXTENT OF SIGNIFICANT CONTRIBUTION ELY YELLAND FIELD METEOROLOGICAL DATA (KM)
NO_2	10.5	4.6
SO_2	45.3	50[a]
PM_{10}	6.6	7.9

Notes: (a) Per New Source Review Workshop Manual, Draft October 1990, pp.C.26 (EPA 1990).

The maximum impacts predicted from the North Plant Site operations are quantified below in **Table 4A.3-3**. That table shows that the North Plant Site would not exceed federal and state limits for incremental degradation, and that facility impacts combined with measured background concentrations would not approach national or Nevada ambient air quality standards. Impact predictions are generally higher for analyses using Ely Yelland Field meteorological data, partly because the North Plant Site is approximately 25 miles north of Yelland Field and subject to different local meteorological conditions further north up Steptoe Valley. For that reason, distance and orientation to maximum impacts reported are from analyses using onsite North Plant Site meteorological data (unlike for South Plant Site analyses, where distance and orientation to maximum predicted impact were based upon the higher impact prediction for either meteorological data set).

TABLE 4A.3-3. AIR QUALITY MODELING PREDICTED MAXIMUM: NORTH PLANT SITE

POLLUTANT	AVER. PERIOD	EEC MET. DATA MAXIMUM MODELED CONC. ($\mu G/M^3$)[A]	ELY YELLAND FIELD MET. DATA MAXIMUM MODELED CONC. ($\mu G/M^3$)[A]	BACKGR. CONCS. MEASURED ONSITE ($\mu G/M^3$)	DISTANCE AND ORIENTATION OF MAXIMUM IMPACT LOCATION FROM PROPOSED BOILER STACKS	PSD INCREMENT LIMIT IN CLASS II AREAS	NAAQS AND NEVADA AAQS ($\mu G/M^3$)
NO_2	Annual	9.4	20.1	4.5	1.6 miles NNE	25	100
PM_{10}	24 hours	26.0	22.6	13.5	0.8 miles W	30	150
	Annual	6.5	4.9	4.9	0.7 miles NE	17	50
SO_2	3 hours	129	415	4.0	4.5 miles SE	512	1300
	24 hours	6.5	17.9	3.0	2.0 miles NNE	91	365
	Annual	0.85	1.19	3.0	2.9 miles NNE	20	80
CO	1 hour	248	656	NA	1.4 miles NNE	NA	40000
	8 hours	79	93.7	NA	1.5 miles NNE	NA	10000

a - The NO_x to NO_2 conversion factor of 0.75 is applied

Analyses in **Section 5.6** of the DEIS include the effects on all other current or reasonably foreseeable sources in a more complete assessment of ambient air quality when the proposed facility would be operating at maximum potential, and incremental degradation since threshold dates against applicable impact limits under those conditions.

The only pollutant for which the proposed EEC would have predicted significant contributions to air quality levels in any Class II area with special land management designation is SO_2. PM_{10} and NO_2 significant contributions are limited to Steptoe Valley, and there are no predicted areas of significant CO contributions from the North Plant Site operation. The significant SO_2 contribution contours shown in **Figures 4.6-3** and **4.6-4** of the DEIS reach or cover portions of the Becky Peak and Goshute Canyon Wilderness Areas. The human and ecological risk assessment analyses described later in this section further define potential impacts and human and ecological risks within 50 kilometers of the proposed EEC, including those and other Class II areas with special land management designations.

The impacts of potential abandonment would be the same as described for the South Plant Site.

Visibility / Regional Haze

Quantitative estimates of Δb_{ext} were prepared to estimate visibility extinction for the two Class I areas and the two identified sensitive Class II areas selected by the FLMs, using meteorological data from the years 2002 through 2004. As with the South Plant Site analysis, predicted visibility degradation in the analysis utilizing the proposed FLAG updated methodology was under the Tier I threshold at Zion National Park, but exceeded that threshold at the Jarbidge Wilderness Area. A Tier 2 analysis was performed. **Table 4A.3-4** shows that the maximum visibility degradation predicted in the Tier II analysis over all days for the three years studied at Zion National Park was 2.8% increase in Δb_{ext}, but the table also shows that for Jarbidge Wilderness Area increases in Δb_{ext} reached as high as 10.0%, at the top of the FLAG screening threshold of five to ten percent range which was to be reached infrequently and not exceeded.

TABLE 4A.3-4. NORTH PLANT SITE CLASS I VISIBILITY IMPACT MODELING TIER 2 ANALYSIS RESULTS

VISIBILITY PARAMETER	AVERAGING PERIOD	MODELED IMPACT FOR METEOROLOGICAL YEAR (% DEGRADATION)			SCREENING THRESHOLD
		2002	2003	2004	
JARBIDGE WA (CLASS I)					
Max Δb_{ext} (%)	24 hours	8.4	5.9	10.0	5%
No. days > 5%	NA	4	1	10	NA
No. days > 10%	NA	0	0	1	NA
ZION NP (CLASS I)					
Max Δb_{ext} (%)	24 hours	2.8	2.3	2.1	5%
No. days > 5%	NA	0	0	0	NA
No. days > 10%	NA	0	0	0	NA
GREAT BASIN NP (CLASS II)					
Max Δb_{ext} (%)	24 hours	12.8	15.8	12.0	NA
No. days > 5%	NA	41	61	22	NA
No. days > 10%	NA	9	23	5	NA
RUBY LAKE NWR (CLASS II)					
Max Δb_{ext} (%)	24 hours	15.9	8.9	11.6	NA
No. days> 5%	NA	17	7	23	NA
No. days > 10%	NA	9	0	5	NA

Note: NA Not applicable

An analysis of conditions on the fifteen days over the three years that visibility extinction reached the lower end of the FLAG screening threshold showed that all nine days occurred in November, December, or January. All but six of the days were associated with weather events

documented at the two NWS stations in the vicinity (in Ely and Elko). The other nine days all featured mist or precipitation reported at one or both of the NWS observation stations. On the six days without precipitation, only one day had predicted Δb_{ext} increases of over eight percent, and only three had predicted increases over seven percent. Considering the infrequent occurrence of modeled values exceeding five percent based on the Tier 2 analysis, the lack of any days with predicted increases in b_{ext} over ten percent, the reasonable but conservative modeling analysis, weather conditions limiting visibility on most days, and the high level of pollution control proposed for the EEC, NDEP concurred that the analyses indicate that Class I area visibility impacts from the Proposed Action would be within ranges recommended by the FLAG guidance.

Visibility analyses prepared using the historic FLAG guidance employing CALPUFF Method 2 post-processing indicated a similar pattern of maximum impacts predicted in the cold weather season. That analysis showed 40 days total and 14 days without precipitation or extensive cloud cover with b_{ext} increases as a result of the proposed action over five percent at the Jarbidge Wilderness Area in the three years studied, and 17 days total and 1 no days without precipitation or extensive cloud cover in three years with b_{ext} increases as a result of the Proposed Action over five percent at Zion National Park.. The Method 2 analyses showed 24 days in three years at the Jarbidge Wilderness Area and 4 days at Zion National Park with b_{ext} increases as a result of the proposed action over ten percent. Only seven of those days did not feature precipitation or significant overcast.

Because of the consistent results and NDEP concurrence during their review of the facility's permit application that the visibility analyses described for the South Plant Site demonstrates compliance with applicable visibility impact limits clearly implies that they would reach the same conclusion for the North Plant Site.

The analyses of the potential for localized fogging or inversion trapping pollutants in Steptoe Valley reported for the South Plant Site, showing little threat of pollutant concentrations above those reported from modeled results or fogging affecting local conditions as far as Highway 95, are representative for the North Plant Site Alternative as well.

Deposition of Nitrates and Sulfates

Quantitative estimates of deposition of nitrates and sulfates were prepared for the Class I areas and identified sensitive Class II areas selected by the FLMs consistent with the methodologies described for the South Plant Site analysis. The results of that analysis, displayed in **Table 4A.3-5**, show long-term model predicted deposition levels at Class I areas Zion National Park and the Jarbidge Wilderness Area, and also for Great Basin National Park and Ruby Lake National Wildlife Refuge comparable to those described for the South Plant Site analysis. Predicted deposition levels for this alternative, like those for the South Plant Site alternative, are within the BLM recommended cumulative range across all Class I and Class II areas analyzed. Those predicted impacts are slightly lower for Great Basin National Park, but the one percent increase predicted as a result of the proposed action would still bring operational nitrogen deposition levels near the threshold at which NPS observed acidification impacts in high mountain ecosystems in Rocky Mountain National Park. The impact of the deposition of numerous compounds closer to the plant site was assessed through the application of a risk assessment model as describer for the South Plant Site.

TABLE 4A.3-5. NORTH PLANT SITE CLASS I AREA MODELED DEPOSITION RESULTS

DEPOSITION PARAMETER	AVERAGING PERIOD	MODELED DEPOSITION FOR METEOROLOGICAL YEAR (KG/HECTARE/YR)			MEASURED BACKGROUND DEPOSITION RATES	MAX. TOTAL DEP.	BLM TOTAL DEPOSITION THRESHOLD
		2002	2003	2004			
JARBIDGE WA (CLASS I)							
Nitrogen	Annual	0.001	0.002	0.004	2.14	2.144	3.0
Sulfur	Annual	0.003	0.005	0.008	0.76	0.768	5.0
ZION NP (CLASS I)							
Nitrogen	Annual	0.001	0.001	0.001	2.14	2.144	3.0
Sulfur	Annual	0.003	0.002	0.008	0.76	0.768	5.0
GREAT BASIN NP (CLASS II)							
Nitrogen	Annual	0.014	0.013	0.012	2.14	2.182	3.0
Sulfur	Annual	0.029	0.025	0.025	0.76	0.789	5.0
RUBY LAKE NEW (CLASS II)							
Nitrogen	Annual	0.003	0.005	0.008	2.14	2.148	3.0
Sulfur	Annual	0.012	0.012	0.019	0.76	0.779	5.0

NA = Not applicable

Risk Assessment

The methodology for the North Plant Site Alternative analysis was the same as that described for the South Plant Site. Because of differences in parcel shapes and layouts between the two facilities, the receptor network for the North Plant Site analysis featured 13,387 receptors. The larger number of receptors for the North Plant Site is due to the longer fence line that parcel would have.

Human Health Risk Assessment

The methodology utilized for the HHRA is the same as that described for the South Plant Site, except for refinements to account for site specific differences. Land use around the North Plant Site was generally consistent with that described for the South Plant Site. The population within 50 kilometers of the plant site was only 141 people according to the 2000 census. Approximately 20 of those people lived in Currie, 15 people on the Goshute Indian reservation, and 12 live on the Ogden Ranch Indian Reservation. No schools or areas of concentrated sensitive population were identified in the 50 km analysis area. Although the town of Cherry Creek, about 16 km west-southwest of the North Plant Site, is not a "town" (according to the 2000 census designation), it has a population of about 93, based on the number of people living in that area that identify Cherry Creek as their post office location, and it was considered accordingly.

The HHRA included residential receptors in Currie, on the Goshute and Ogden Ranch Indian Reservations, and at Lages Station. The maximally exposed subsistence fisherman was assumed to live in the maximally exposed populated area, the ranch with the predicted highest deposition rate, and fish in a small creek 7 km north of the North Plant Site location. Inhalation risks were calculated for receptors at the ranches with the highest predicted air concentrations, a receptor assumed to be at the maximally exposed location where there is not currently a residence, and in Currie and on each Indian Reservation.

HHRA results show that no receptor studied would be exposed to total excess cancer risks reaching the threshold of 1 in 100,000 ($1x10^{-5}$). Three receptors exceeded the target of 1 in 1 million ($1x10^{-6}$) only under the unlikely scenario of maximum emissions from both the main boilers and the auxiliary boilers over the long term. Those three potentially impacted receptors were the maximally exposed adult subsistence farmer with a risk of $2x10^{-6}$, an adult subsistence fisherman living in the maximally exposed residential area with the same risk, and a subsistence farmer living at the maximum air concentration location (where no farming currently exists) with a risk of $1x10^{-6}$.

All those risks are within the EPA acceptable range of 10^{-4} to 10^{-6}. Subsistence farmers at all locations where ranching currently exists were predicted to have excess cancer risks of 10^{-6} (1 in 1 million) or less. Excess cancer risks associated with emissions from the energy center main boilers, which should represent the vast majority of boiler emissions over the long term, were predicted to be less than 1 in 1 million. Only the conservative assumption of maximum emissions from the main boilers and simultaneous maximum production from the auxiliary boilers as well, an unlikely scenario for any duration, results in any risk greater than 1 in 1 million.

Maximum total hazards calculated were 0.25 for a subsistence farmer's child living in the maximally exposed residential area, well below the recommended screening threshold of 1. The maximum acute hazard quotient (AHQ) calculated for any receptor studied reached the screening threshold of 1 only at the unoccupied maximally exposed location (where there is no regular human activity). The maximum predicted ADD_{infant} exposure rate of 2.7 pg/kg for the child of a subsistence farmer is well below the EPA recommended safety screening threshold of 93 pg/kg.

Table 4A.3-6 presents the maximum media concentrations for each human health land use for arsenic, lead, and mercury (as methyl mercury and mercuric chloride), and the receptor locations at which they occurred. Media concentrations were calculated using the latest version of the "Industrial Risk Assessment Program – Human Health (IRAP-h View) software (Tetra Tech 2008b). Site-specific baseline conditions were not employed as inputs into the media concentration calculations; rather, the media concentrations provided represent those concentrations occurring solely as a result of the Alternative Action. However, the model conservatively estimates the maximum emission scenario of all three boilers – MSK1, MSK2, and the auxiliary boiler – operating concurrently. All concentrations are significantly less than EPA-recommended thresholds (as reported in EPA's Integrated Risk Information System [IRIS]) and the Cal-Modified EPA remediation goals (as reported in CalEPA [1997]), where applicable.

TABLE 4A.3-6. MAXIMUM MEDIA CONCENTRATIONS FOR SELECTED COPC'S ANALYZED FOR THE NORTH PLANT SITE ALTERNATIVE IN THE HHRA[1]

COPC	SOIL[2]	WATER[3]	AIR[4]
Arsenic	4.45×10^{-8} (MEI)	2.26×10^{-7} (Schellbourne Station)	1.29×10^{-4} (MEI)
Lead	4.38×10^{-5} (MEI)	2.37×10^{-7} (Schellbourne Station)	1.48×10^{-4} (MEI)
Methyl Mercury	4.45×10^{-5} (MEI)	1.79×10^{-9} (Schellbourne Station)	N/A[5]
Mercuric Chloride	2.19×10^{-3} (MEI)	2.11×10^{-8} (Schellbourne Station)	3.95×10^{-5} (MEI)

1 Model receptor location where maximum concentration was observed provided in parentheses.
2 Soil concentration due to deposition, as mg COPC/kg soil.
3 Total water column concentration, as mg COPC/L water; except methyl mercury, reported for dissolved-phase water column concentration, as mg COPC/L water.
4 Air concentration (chronic), as µg COPC/m3.
5 Air concentrations for methyl mercury were not provided.
Source: Tetra Tech 2008b

Ecological Risk Assessment

The methodology for the North Plant Site ERA was the same as that described for the South Plant Site, except Duck Creek and Schoolhouse Spring were used as the aquatic habitats instead of Bassett Lake and McGill Spring. The four terrestrial habitats evaluated were shrub-steppe, montane, Duck Creek/shrub-steppe, and Duck Creek/montane, and the two aquatic habitats evaluated were Duck Creek and Schoolhouse Spring.

In the shrub-steppe terrestrial habitat, HQs did not exceed 1 for any COPC in any receptor. The highest source-specific HQ value, due to emissions from the two main boilers, was presented by 2,3,7,8-TCDD (HQ = 1.1E-02) for the carnivorous mammal guild (represented by the coyote) feeding exclusively on herbivorous birds (modeled as the sage grouse). Receptor-specific HI values did not exceed 1 for the North Plant Site for all dietary scenarios. The highest HI value occurred in the omnivorous bird guild, represented by the American robin (HI = 1.8E-02).

In the montane terrestrial habitat, HQs did not exceed 1 for any COPC in any receptor. The highest source-specific HQ value, due to emissions from the MSK2 boiler, was presented by 2,3,7,8-TCDD (HQ = 7.4E-04) for the carnivorous mammal guild (represented by the long-tailed weasel) feeding exclusively on omnivorous birds (modeled as the American robin). Receptor-specific HI values did not exceed 1 for the North Plant Site for all dietary scenarios. The highest HI value occurred in the omnivorous bird guild, represented by the American robin (HI = 9.9E-04).

COPC-specific HQs for the Duck Creek/shrub-steppe receptors (birds and mammals assumed to be foraging and hunting around the Duck Creek area) were also less than 1. The highest HQ value, which resulted from operation of both boilers, was presented by 2,3,7,8-TCDD (HQ = 5.6E-02) for carnivorous mammals feeding exclusively on herbivorous birds. Receptor-specific HI values did not exceed 1 for the North Plant Site for all dietary scenarios. The highest HI value occurred in the carnivorous mammal guild, represented by the coyote (HI = 4.1E-02).

COPC-specific HQs for the Duck Creek/montane receptors were also less than 1. The highest HQ value, which resulted from the operation of both boilers, was presented by methyl mercury (HQ = 5.8E-02) for carnivorous mammals (modeled as the long-tailed weasel) feeding exclusively on omnivorous birds (modeled as the chukar). Receptor-specific HI values did not exceed 1 for the North Plant Site for all dietary scenarios. The highest HI value occurred in the carnivorous mammal guild, represented by the coyote (HI = 3.9E-02).

In the aquatic habitat modeled as Duck Creek, HQs did not exceed 1 for any COPC in any receptor. The highest HQ value, which resulted from emissions from the MSK1 boiler, was presented by 2,3,7,8-TCDD (HQ = 2.2E-01) for the omnivorous mammal guild (represented by the muskrat) consuming exclusively benthic invertebrates. Receptor-specific HI values did not exceed 1 for the North Plant Site for all scenarios. The highest HI value occurred in the carnivorous bird guild, represented by the red-tailed hawk (HI = 3.2E-01).

In the aquatic habitat modeled as Schoolhouse Spring, HQs did not exceed 1 for any COPC in any receptor. The highest HQ value, which resulted from emissions from both boilers, was presented by copper (HQ = 6.1E-03) for the aquatic life community. Receptor specific HI values did not exceed 1 for the North Plant Site for all scenarios. The highest HI value occurred in the aquatic life community (HI = 1.4E-02).

Inhalation risk was also evaluated for each boiler for mammals. All of the HI values are below 1, indicating that emissions from the boilers at the North Plant Site do not present an inhalation risk to mammals (Tetra Tech 2008a). The HI value associated with ecological inhalation was 2.1E-06.

Table 4A.3-7 presents the maximum media concentrations for each ecological habitat evaluated for arsenic, lead, and mercury (as methyl mercury and mercuric chloride), and the habitat receptor locations at which they occurred. Media concentrations were calculated using the method described above for the HHRA.

TABLE 4A.3-7. MAXIMUM MEDIA CONCENTRATIONS FOR SELECTED COPC'S ANALYZED FOR THE NORTH PLANT SITE ALTERNATIVE IN THE SLERA[1]

COPC	SOIL[2]	WATER[3]	AIR[4]
Arsenic	9.63×10^{-9} (Shrub Steppe)	2.82×10^{-7} (Schoolhouse Spring)	9.69×10^{-5} (Duck Creek)
Lead	9.43×10^{-6} (Shrub Steppe)	2.91×10^{-7} (Schoolhouse Spring)	1.00×10^{-4} (Duck Creek)
Methyl Mercury	2.77×10^{-6} (Shrub Steppe)	1.79×10^{-9} (Duck Creek, Montane, Shrub Steppe)	N/A[5]
Mercuric Chloride	1.36×10^{-4} (Shrub Steppe)	2.38×10^{-8} (Duck Creek, Montane, Shrub Steppe)	3.25×10^{-6} (Duck Creek)

1 Model habitat receptor location where maximum concentration observed provided in parentheses.
2 Soil concentration due to deposition, as mg COPC/kg soil.
3 Total water column concentration, as mg COPC/L water; except methyl mercury, reported for dissolved-phase water column concentration, as mg COPC/L water.
4 Air concentration (chronic), as µg COPC/m3.
5 Air concentrations for methyl mercury were not provided.
Source: Tetra Tech 2008b

Because receptor-specific HI values for each boiler and for all boilers operating at once are less than 1, operation of the North Plant Site would not adversely affect assessment endpoints for terrestrial and aquatic receptors and communities.

COPC-specific HQs and receptor-specific HIs for all scenarios are provided in Appendix E of Tetra Tech (2008a).

4A.3.2 Direct and Indirect Effects on Air Quality from Rail Facilities

Construction

There are no residences within 2 miles of the rail lead. Construction emissions would be generally the same as the South Plant Site alternative, except that emissions estimates would be greater for the rail lead to the North Plant Site because it is almost four times longer in length.

Regarding the Alternative Rail Line, the line would be approximately 37 miles shorter, thus reducing the emission estimates from what was described for the Proposed Action.

Operation

Train emissions on-site were included in the emissions and impact analysis for the EEC in the air permit application and in this EIS. Operating conditions would be similar to those for the Proposed Action except the rail line from Shafter to the North Plant Site would be 37 miles less than the Proposed Action. Emissions and impacts would be as described for the Proposed Action from Shafter to the North Plant Site, but would eliminate all EEC-related train traffic and emissions further to the south. The annual air pollutant emissions from the diesel train engines between Shafter and the EEC along the NNRy and rail lead with the plant site operating at maximum capacity were estimated to be 18.1 tons of VOCs, 72.4 tons of CO, 243.6 tons of NO_x, 19.2 tons of SO_2, and 14.8 tons of PM_{10}.

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Appendix 4B
Visual Contrast Rating Sheets

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 1, View to NW	UTM Zone 11, NAD83
VRM Class	IV (Elko District)	E 0698913
		N 4449860

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Flat (highway)
Line	Horizontal and diagonal	Divided by diagonal band	Straight
Color	Tan	Gray-green	Dark gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Bold (crossing signs)
Line	Horizontal and diagonal	Divided by diagonal band	Vertical (supports for signs)
Color	Dark gray pavement, tan shoulder	Gray-green	Vivid contrasting signage, dark gray pavement
Texture	Smooth	Medium, uniform	Contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Private rail line is in foreground-middleground zone. Tracks would not be visible except from a very short distance. Railroad crossing signage would be noticeable but, at highway speeds, only briefly. VRM Class IV allows for strong contrast.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 2, View to W	UTM Zone 11, NAD83
VRM Class	III (Ely District)	E 0703347
		N 4437633

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple, non-directional	Irregular, indistinct (buildings, fence)
Line	Horizontal	Distant diffuse edge	Weak, irregular
Color	Light brown	Gray-green	Indistinct
Texture	Smooth	Medium, uniform	Non-uniform

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple, non-directional	Indistinct (rail line, pipeline, support structures)
Line	Horizontal	Distant diffuse edge	Weak, irregular
Color	Light brown	Gray-green	Indistinct
Texture	Smooth	Medium, uniform	Non-uniform

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Mt. Wheeler transmission line, new rail line, and pipeline are in foreground-middleground zone. Rail line and water pipeline would be hidden by shrubs. Trains on the tracks would be visible but would not dominate the view because of the distance from KOP. At 2.5 miles the Mt. Wheeler transmission line would be difficult to see.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action	**KOP Location**
Key Observation Point	KOP 3, View to E	UTM Zone 11, NAD83
VRM Class	III, IV (Ely District)	E 0681007 N 4418887

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Flat (highway)
Line	Horizontal	Divided by diagonal band	Horizontal
Color	Light brown	Gray-green	Gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Indistinct
Line	Horizontal	Divided by diagonal band	Diffuse
Color	Light brown	Gray-green	Subtle
Texture	Smooth	Medium, uniform	Uniform

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in background zone, over 7 miles distant. Rail line and water pipeline would also be hidden by shrubs. Trains on the tracks could be visible but they would be infrequent and would not attract attention because of the distance from the KOP. Mt. Wheeler transmission line would likely be very difficult to see.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – North Plant Site Alternative	KOP Location
Key Observation Point	KOP 3, View to E	UTM Zone 11, NAD83
VRM Class	III, IV (Ely District)	E 0681007
		N 4418887

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Flat (highway)
Line	Horizontal	Divided by diagonal band	Horizontal
Color	Light brown	Gray-green	Gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Indistinct (power plant, transmission lines)
Line	Horizontal	Divided by diagonal band	Geometric
Color	Light brown	Gray-green	Concrete gray, coated metal, painted buildings
Texture	Smooth	Medium, uniform	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in background zone. North Plant Site components would be 8.5 miles distant and inconspicuous despite their large size. Segment 1A transmission lines would be 8 miles distant and Segment 1B transmission lines would be 3 miles distant on VRM Class IV land. Because of the distance from KOP 3 to elements of North Plant Site Alternative, they would not attract attention and management objectives for both Class III and Class IV would be met.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action	**KOP Location**
Key Observation Point	KOP 4, View to N	UTM Zone 11, NAD83
VRM Class	II, III (Ely District)	E 0693335
		N 4407750

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Flat (highway)
Line	Horizontal	Divided by diagonal band	Straight
Color	Light brown	Gray-green, tan	Dark gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Indistinct (rail line and pipeline not visible)
Line	Horizontal	Divided by diagonal band	Diffuse
Color	Light brown	Gray-green, tan	Subtle
Texture	Smooth	Medium, uniform	Uniform

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Rail line and water pipeline would be hidden by shrubs. Trains on the tracks would be visible but they would be infrequent would not attract attention because of the distance from the KOP. Mt. Wheeler transmission line would be greater than 0.5 mile distant.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 4, View to N	UTM Zone 11, NAD83
VRM Class	II, III (Ely District)	E 0693335
		N 4407750

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Flat (highway)
Line	Horizontal	Divided by diagonal band	Straight
Color	Light brown	Gray-green, tan	Dark gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by highway	Indistinct (power plant, transmission lines)
Line	Horizontal	Divided by diagonal band	Diffuse
Color	Light brown	Gray-green, tan	Subtle
Texture	Smooth	Medium, uniform	Uniform

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. North Plant Site would be approximately 10 miles distant and would be difficult to see. Mt. Wheeler transmission line, rail line, and water pipeline would be greater than 0.5 mile distant. These project elements would not attract attention and management guidelines for Class II and III would be met. The portion of transmission line Segment 1A (alternative) that would be visible in the view north from KOP 4 would be over 2 miles distant and on VRM Class III land. It would not dominate the view and management guidelines for Class III would be met.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action	**KOP Location**
Key Observation Point	KOP 5, View to W	UTM Zone 11, NAD83
VRM Class	II, III, IV (Ely District)	E 0693154
		N 4407678

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by dirt road	Flat (road, fence)
Line	Horizontal	Divided by diagonal band	Straight
Color	Light brown	Gray-green, tan	Dark gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by dirt road	Indistinct (rail line and pipeline not visible)
Line	Horizontal	Divided by diagonal band	Diffuse
Color	Light brown	Gray-green, tan	Subtle
Texture	Smooth	Medium, uniform	Uniform

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Rail line and water pipeline would be hidden by shrubs. Trains on the tracks would be visible but they would be infrequent. The Mt. Wheeler transmission line, rail line, and water pipeline would be greater than 0.5 mile distant and would not tend to attract attention. Management goals for VRM Class II and II would be met.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 5, View to W	UTM Zone 11, NAD83
VRM Class	II, III, IV (Ely District)	E 0693154
		N 4407678

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by dirt road	Flat (road, fence)
Line	Horizontal	Divided by diagonal band	Straight
Color	Light brown	Gray-green, tan	Dark gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by dirt road	Indistinct (transmission lines)
Line	Horizontal	Divided by diagonal band	Diffuse
Color	Light brown	Gray-green, tan	Subtle
Texture	Smooth	Medium, uniform	Uniform

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. Transmission line Segment 1A, Mt. Wheeler transmission line, rail line, and water pipeline are in foreground-middleground zone in VRM Class II and III; Segment 1B is in the background zone in VRM Class IV. The rail line and water pipeline would likely not be visible and the Mt. Wheeler transmission line and Segment 1A transmission lines are likely far enough away that they would not attract attention when viewed from KOP 5.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action	**KOP Location**
Key Observation Point	KOP 6, View to W	UTM Zone 11, NAD83
VRM Class	III, IV (Ely District)	E 0692437
		N 4391804

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by dirt road	Flat (road, fence, buildings)
Line	Horizontal	Divided by diagonal band	Straight
Color	Light brown, gray	Gray-green, tan	Dark gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by dirt road	Indistinct (rail line and pipeline not visible)
Line	Horizontal	Divided by diagonal band	Diffuse
Color	Light brown	Gray-green, tan	Subtle
Texture	Smooth	Medium, uniform	Uniform

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Rail line and water pipeline would be hidden by shrubs. Trains on the tracks would be visible but they would be infrequent. The trains and the Mt. Wheeler transmission line would be approximately 0.25 miles distant and would not dominate the view from KOP 6.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 6, View to W	UTM Zone 11, NAD83
VRM Class	III, IV (Ely District)	E 0692437
		N 4391804

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by dirt road	Flat (road, fence, buildings)
Line	Horizontal	Divided by diagonal band	Straight
Color	Light brown	Gray-green, tan	Dark gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms divided by dirt road	Large, prominent support structures and wires
Line	Horizontal	Divided by diagonal band	Bold, geometric
Color	Light brown	Gray-green, tan	Coated metal
Texture	Smooth	Medium, uniform	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
The rail line, water pipeline, and Mt. Wheeler Transmission line are in foreground-middleground zone (approximately 0.25 miles distant) in VRM Class III. Transmission line Segment 1C would be over 3 miles distant on VRM Class IV. The rail line and water pipeline would be hidden by shrubs and trains on the tracks would be visible but they would be infrequent. At these distances, project elements would not dominate the view and management objectives would be met for VRM Class III and IV.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action	**KOP Location**
Key Observation Point	KOP 7, View to N	UTM Zone 11, NAD83
VRM Class	III (Ely District)	E 0691573
		N 4365127

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Linear, regular (poles) small buildings, fences
Line	Horizontal	Horizontal	Vertical, geometric
Color	Light brown	Gray-green, tan	Dark brown, tan
Texture	Smooth	Medium, uniform	Smooth, patchy

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Large, prominent plant structures
Line	Horizontal	Horizontal	Bold, geometric
Color	Light brown	Gray-green, tan	Concrete gray, coated metal, painted buildings
Texture	Smooth	Medium, uniform	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in background zone approximately 5 miles distant. Plant structures would be difficult to see from KOP 7 because of the distance. Consistent with VRM Class III objectives when viewed from KOP 7.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: August 2008

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 7, View to N	UTM Zone 11, NAD83
VRM Class	III (Ely District)	E 0691573
		N 4365127

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Linear, regular (poles) small buildings, fences
Line	Horizontal	Horizontal	Vertical, geometric
Color	Light brown	Gray-green, tan	Dark brown, tan
Texture	Smooth	Medium, uniform	Smooth, patchy

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Indistinct (pipeline and rail facilities not visible)
Line	Horizontal	Horizontal	Diffuse
Color	Light brown	Gray-green, tan	Subtle
Texture	Smooth	Medium, uniform	Uniform

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	4
Line	4	4	4
Color	4	4	4
Texture	4	4	4

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements would not be visible from KOP 7 under the North Plant Site Alternative.

Additional mitigating measures recommended. None

Evaluator: R. Duncan
Date: August 2008

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 8, View to SW	UTM Zone 11, NAD83
VRM Class	III, IV (Ely District)	E 0660184
		N 4366048

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Rolling hills	Irregular, divided by highway	Flat (highway)
Line	Undulating	Divided by curving road	Straight
Color	Light brown, gray	Dark and light green, gray	Dark gray
Texture	Coarse, patchy	Coarse, patchy	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Rolling hills	Irregular, divided by highway	Large, prominent (support structures and wires)
Line	Undulating	Divided by curving road	Bold, geometric
Color	Light brown, gray	Dark and light green, gray	Coated metal
Texture	Coarse, patchy	Coarse, patchy	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	2
Color	4	4	2
Texture	4	4	2

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. The large transmission line support structures would contrast with the existing landscape but they are far enough away from the highway that they should not dominate the view. The rolling hills would tend to hide the structures much of the time and the substation would not be visible.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 8, View to N	UTM Zone 11, NAD83
VRM Class	IV (Ely District)	E 0659761
		N 4365858

Section B. Characteristic Landscape Description

	Land/Water	**Vegetation**	**Structures**
Form	Rolling hills, steep road cut	Irregular, bounded by highway	Flat (highway)
Line	Linear	Horizontal line	Straight
Color	Light brown, gray	Dark and light green, gray	Dark gray
Texture	Coarse, patchy	Coarse, patchy	Smooth

Section C. Proposed Activity Description

	Land/Water	**Vegetation**	**Structures**
Form	Rolling hills	Irregular, divided by highway	Large, prominent (support structures and wires)
Line	Undulating	Divided by curving road	Bold, geometric
Color	Light brown, gray	Dark and light green, gray	Coated metal
Texture	Coarse, patchy	Coarse, patchy	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	**Vegetation**	**Structures**
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. The large transmission line support structures would contrast with the existing landscape but they would be largely hidden by the hill on the north side of the highway. Wires crossing the highway would be visible but for only a short time at highway speeds.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	KOP Location
Key Observation Point	KOP 9, View to NW	UTM Zone 11, NAD83
VRM Class	IV (Ely District)	E 0653953
		N 4303340

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms bounded by highway	Flat (highway)
Line	Horizontal	Horizontal boundary	Straight
Color	Light gray highway	Gray-green	Dark gray
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms bounded by highway	Large, prominent (support structures and wires)
Line	Horizontal	Horizontal boundary	Bold, geometric
Color	Light gray highway	Gray-green	Coated metal
Texture	Smooth	Medium, uniform	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	2
Color	4	4	2
Texture	4	4	2

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Transmission line support structures near the highway would contrast with the existing landscape but the nearest would be approximately 600 feet away. Wires crossing the highway would be visible but for only a short time at highway speeds.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 9, View to SE	UTM Zone 11, NAD83
VRM Class	IV (Ely District)	E 0653953
		N 4303340

Section B. Characteristic Landscape Description

	Land/Water	**Vegetation**	**Structures**
Form	Flat terrain	Simple forms	None
Line	Horizontal	Horizontal boundary	None
Color	Gray-green	Gray-green	None
Texture	Smooth	Medium, uniform	None

Section C. Proposed Activity Description

	Land/Water	**Vegetation**	**Structures**
Form	Flat terrain	Simple forms	Large, prominent (support structures and wires)
Line	Horizontal	Horizontal boundary	Bold, geometric
Color	Gray-green	Gray-green	Coated metal
Texture	Smooth	Medium, uniform	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	**Vegetation**	**Structures**
Form	4	4	2
Line	4	4	2
Color	4	4	2
Texture	4	4	2

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Transmission line support structures near the highway would contrast with the existing landscape but the nearest would be approximately 600 feet away. Wires crossing the highway would be visible but for only a short time at highway speeds.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 10, View to NNE	UTM Zone 11, NAD83
VRM Class	IV (Ely District)	E 0695627
		N 4166057

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Flat (highway, building, vertical support structures)
Line	Horizontal	Horizontal boundary	Simple
Color	Gray, tan	Gray-green	Light gray, dark brown
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Large, prominent (support structures and wires)
Line	Horizontal	Horizontal boundary	Bold, geometric
Color	Gray, tan	Gray-green	Coated metal
Texture	Smooth	Medium, uniform	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	2
Color	4	4	2
Texture	4	4	2

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Transmission line support structures near the highway would contrast with the existing landscape but the nearest would be approximately 600 feet away. Wires crossing the highway would be visible but for only a short time at highway speeds.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 10, View to SSW	UTM Zone 11, NAD83
VRM Class	IV (Ely District)	E 0695627
		N 4166057

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Regular (support structures, fence)
Line	Horizontal	Horizontal boundary	Vertical, simple
Color	Gray, tan	Gray-green, tan	Dark brown
Texture	Smooth	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Large, prominent (support structures and wires)
Line	Horizontal	Horizontal boundary	Bold, geometric
Color	Gray tan	Gray-green, tan	Coated metal
Texture	Smooth	Medium, uniform	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	2
Color	4	4	2
Texture	4	4	2

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Transmission line support structures near the highway would contrast with the existing landscape but the nearest would be approximately 600 feet away. Wires crossing the highway would be visible but for only a short time at highway speeds.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 11, View to N	UTM Zone 11, NAD83
VRM Class	III, IV (Ely District)	E 0675908
		N 4117412

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Rolling hills	Simple forms	Flat (highway)
Line	Horizontal	Horizontal boundary	Simple
Color	Gray, tan	Gray-green	Light/dark gray
Texture	Coarse, patchy	Medium, uniform	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Rolling hills	Simple forms	Large, prominent (support structures and wires)
Line	Horizontal	Horizontal boundary	Bold, geometric
Color	Gray, tan	Gray-green	Coated metal
Texture	Coarse, patchy	Medium, uniform	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	2
Color	4	4	2
Texture	4	4	2

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Transmission line support structures near the highway would contrast with the existing landscape but the nearest would be approximately 600 feet away. Wires crossing the highway would be visible but for only a short time at highway speeds.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 12, View to NNE	UTM Zone 11, NAD83
VRM Class	III, IV (Ely District)	E 0680234
		N 4092824

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Rolling hills	Simple forms	Flat, regular (highway, support structures)
Line	Horizontal	Horizontal boundary	Vertical, simple
Color	Gray, tan	Gray-green	Dark brown
Texture	Coarse, patchy	Patchy	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Rolling hills	Simple forms	Large, prominent (support structures and wires)
Line	Horizontal	Horizontal boundary	Bold, geometric
Color	Gray, tan	Gray-green	Coated metal
Texture	Coarse, patchy	Patchy	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	2
Color	4	4	2
Texture	4	4	2

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. Transmission line support structures near the highway would contrast with the existing landscape but the nearest would be approximately 600 feet away. Wires crossing the highway would be visible but for only a short time at highway speeds.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 13, View to NNW	UTM Zone 11, NAD83
VRM Class	IV (Ely District)	E 0681414
		N 4085449

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Flat, regular (highway, support structures)
Line	Horizontal	Diagonal boundary	Vertical, simple
Color	Gray, tan	Gray-green	Dark brown, gray
Texture	Uniform	Patchy	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Large, prominent (support structures and wires)
Line	Horizontal	Diagonal boundary	Bold, geometric
Color	Gray, tan	Gray-green	Coated metal
Texture	Uniform	Patchy	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	2
Line	4	4	2
Color	4	4	2
Texture	4	4	2

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. The nearest new transmission line support structures would be approximately 1,800 feet away. The new transmission line support structures would be larger than the existing ones but the contrast would be less when viewed from the highway because of the greater distance.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Ely Energy Center – Proposed Action and North Plant Site Alternative	**KOP Location**
Key Observation Point	KOP 14, View to NNW	UTM Zone 11, NAD83
VRM Class	IV (Las Vegas District)	E 0688692 N 4028533

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Vertical support structures
Line	Horizontal	Diagonal boundary	Vertical, simple
Color	Gray, tan	Gray-green	Dark brown, light gray
Texture	Uniform	Patchy	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Simple forms	Indistinct (support structures, switching station equipment)
Line	Horizontal	Diagonal boundary	Bold, geometric
Color	Gray, tan	Gray-green	Coated metal
Texture	Uniform	Patchy	Coarse, contrasty

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	4	4	3
Line	4	4	3
Color	4	4	3
Texture	4	4	3

Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes.
Project elements are in foreground-middleground zone. The new transmission lines and switching station equipment are approximately 3.5 miles away and would likely not be visible from the KOP. Management objectives for Class IV would be met.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan
Date: April 2007 (Revised August 2008)

Appendix 5A
Past, Present, and Reasonably Foreseeable Projects

Appendix 5A
Past, Present, and Reasonably Foreseeable Projects

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
4-Mile Basin Minerals Exploration	Nye County – T5N, R47E, sections 16, 17, 20	Mining Exploration	Seabridge Gold Corporation minerals exploration proposal to drill up to 5 holes on existinig roads. Includes up to 2,480 feet of cross country travel. Total surface disturbance 1 acre. Within an Inventoried Roadless Area (IRA).		Socioecon	Future
Alligator Ridge Gold Mine	North of U.S. 50, west of Highway 93, between Ely and Eureka, NV, White Pine County	Mine	Gold mining operation		Socioecon, Land Use	Present, Future
American Asphalt & Grading Company	Clark County, NV, Sec 21, T13S, R63E	Industrial	Aggregate, rock, sand, crushing		Geology & Minerals [All]	Present, Future
Animas/Bloomfield Power Plant	Bloomfield, NM	Power Plant	A 51-MW gas power plant operated and owned by the City of Farmington.		Air Resources**	Existing
Apex Generating Facility, Mirant/LS Power	Apex Industrial Park, Clark County, NV	Power Plant	A 550 MW natural gas, combined cycle power plant	~200 acres	Air Resources**, Land Use, Recreation, Special Designations	Existing
Apex Industrial Park	Apex Industrial Park, Clark County, NV	Industrial	Georgia Pacific Las Vegas Plant, Gypsum Division - Gypsum wallboard manufacturing Apex Quarry and Plant, Chemical Lime Company and Granite Construction - Limestone mining, milling, and processing operations by Chemical Lime, Granite crushes overburden Apex Regional Landfill, Republic Services - Municipal landfill permitted currently using 250 acres Silver States Landfill - Sand, sand/gravel, crushing, screening Apex Landfill Pit/Las Vegas Paving - Sand and gravel operations	~100 acres ~1500 acres 1,100 acres permitted ~300 acres	Air Resources* Land Use, Recreation, Special Designations	Existing
Arrow Canyon	Clark County	Mining District	Silica, building stone		All	Present, Future
Bald Mountain Properties	110 km northwest of Ely, NV, White Pine County	Mine	Gold mining operation	Covers 625 square km with 12 areas with previous production	Air Resources – Cumulative Class II*	Present, Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Barrick Goldstrike Mine	Elko County	Mine	Gold mine includes one open pit and two under ground gold mines		Air Resources – Class I*, Socioecon	Present, Future
Bassett Lake Expansion	White Pine County	Recreation & Conservation	White Pine County and NDOW purchase of Bassett Lake, surrounding acreage, and water rights from Kennecott Copper Company. Once acquired, the proposal for development includes dam replacement, improvement of lake and wetlands, and recreational developments such as picnic areas, a boat launch, and restrooms.	6,000 acres 53 cfs water	Land Use, Recreation, Special Designations	Future
BLM Utility Corridor	Follows the SWIP ROW Grant	Transmission Line	Multiple interstate high voltage electric transmission lines, substations, and gas pipelines; future addition of new lines		All	Portions occupied by existing lines w/ potential for substantial future expansion
Bolo Minerals Exploration	Nye County – T8N, R50E, Sections 17, 20, 21, 29	Mining Exploration	Cordex Exploration Company minerals exploration proposal to drill up to 27 holes on existing roads; construct up to 5100 feet of new roads; 1300 feet of cross country travel. Total surface disturbance 2.2 acres. Within an IRA.		Socioecon	Future
Bristol	Lincoln County	Mining District	Silver, copper, lead, zinc, gold, manganese, montmorillonite		All	Present, Future
Cherry Creek	White Pine County	Mining District	Silver, gold, lead, copper, zinc, tungsten, antimony, coal, fluorspar, beryllium Active mining.		All	Present, Future
Chevron Environmental Management Company	Ely, NV	Industrial			Air Resources – Cumulative Class II*	Present, Future
Chokecherry powerline	T5S R64E section 13, 14,15, 16, 17, 24 T5S R65E Section 16, 17, 18, 19, 20, Lincoln County, NV within the utility corridor west of Caliente.	Transmission line	Transmission line to Chokecherry Commsite	21.910 acres (7.23 miles)	All	Past

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Chuck Lenzie Generating Station, Nevada Power	Apex Industrial Park, Clark County, NV	Power Plant	1,200 MW natural gas, combined cycle power plant		Air Resources**, Land Use, Recreation, Special Designations	Existing
Clark County Conservation of Public Land and Natural Resources Act of 2002	Clark County, NV	Lands Legislation	• Established the Arrow Canyon, Jimbilnan, Jumbo Springs, Lime Canyon, Muddy Mountains, and Pinto Valley Wilderness Areas • Released Wilderness Study Area lands on the southeast boundary of the Desert NWR, contiguous with the Arrow Canyon, Muddy Mountains, and Lime Canyon WAs, and south of the Lime Canyon WA. • Expanded the boundary of the SNPLMA to include 22,000 additional acres identified for disposal, with retention of proceeds for conservation initiatives within Clark County. • Transfer of land parcels from the BLM to the USFWS and NPS for administrative jurisdiction.		Land Use, Special Designations, Recreation, Socioecon	Present/ Future
Clark, Lincoln, and White Pine County Ground Water Development Project (SNWA Project)	Clark, Lincoln, and White Pine counties	Water Project	SNWA has applied to the BLM for ROWs to construct and operate a system of regional water supply facilities. This includes construction and operation of ground water production wells, water conveyance facilities, and power facilities.		Water Resources, Soils, Vegetation, Wildlife	Future
Comet	Lincoln County	Mining District	Lead, silver, zinc, gold, copper, tungsten		Range Resources, Socioecon	Present, Future
Cooper & Sons, Inc.	Ely, NV	Industrial	Concrete, forms, and construction		Air Resources - Cumulative Class II* [Socio, Land Use]	Present, Future
Country Construction	North of Ely, NV	Industrial	Gravel Pit		Air Resources – Cumulative Class II*	Present, Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Coyote Springs Development	About 50 miles north of Las Vegas, east of Hwy 93, north of SR168	Community Develop-ment	Planned community	43,000 acres; 12,000 acres planned for a trail system, nature preserve, parks, open space and multi-species habitat.	All	Future
Coyote Springs Service Rock Products	Lincoln County, NV, Sec 13, T11S, R62E	Industrial	Sand/gravel, crushing, screening		Geology & Minerals [All]	Present, Future
Coyote Springs Valley Well and Moapa Transmission Project	Coyote Springs Valley	Water Project	Groundwater test well and pipeline		Water resources, socioecon	Existing
Coyote Springs Water Pipeline along SR-168	Clark County T13S R63-65E T14S R64-66E	Water Pipeline	Nevada Power Co. has submitted an application for a 14-18-inch water pipeline connecting an existing well in the Coyote Springs area to an existing pipeline.	11.3 miles (~27 acres)		Future
Crystal Substation	Dry Lake Valley, north of Harry Allen substations between US-93 and I-15	Substation	500kV-230kV substation		All	Existing
Currant	White Pine and Nye Counties	Mining District	Gold, lead, copper, tungsten, magnesite, uranium, fluorspar NMC843483, NMC753739 Active mining.		All	Present, Future
Decoy	Elko County	Mining District	Silver, lead, copper, tungsten, titanium		[Range, Socioecon, Land Use]	Present, Future
Delamar	Lincoln County	Mining District	Gold, silver, copper, lead, perelite		All	Present, Future
Desert National Wildlife Refuge Visitor Facilities Draft EA	Clark and Lincoln counties, NV	EA	Draft EA for proposed development of new visitor and administrative facilities.		Land Use, Recreation, Special Designations, Socioecon	Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Desert Rock Energy Project	Navajo Indian Reservation, 30 miles SW of Farmington, San Juan County, NM	Power Plant	1,500 MW coal-fired power plant	Plant site 592 acres	Air Resources*	Future
Disc Golf EA	Ward Recreation Area; 6 mi west of Ely in T16N, R62E Sections 26 & 27	Recreation	fulfilling "Semi-Primitive Non-motorized" recreation opportunities as identified in the Recreation Opportunity Spectrum in White Pine County, Nevada.		Recreation, Special Designations, Socioecon Land Use	Preliminary EA issued Oct 2007
Dolly Varden	Elko County	Mining District	Copper, silver, lead, zinc, gold, molybdenum, thorium and rare earths, uranium NMC956722		All	Present, Future
Dry Lake Solar	Clark County	Energy	Nevada Power Company has applied for a ROW for construction of an approximately 1,700 acre solar facility in the vicinity of the Harry Allen Substation	1,700 acres		Future
Duck Creek	White Pine County	Mining District	Lead, silver, copper, zinc, gold, limestone, fire clay NMC909041		All	Present, Future
Ely Springs	Lincoln County	Mining District	Silver, zinc, lead, gold		All	Present, Future
Ely to Cherry Creek fiber optic line	Between Ely and Cherry Creek, White Pine County	Fiber Optic Line	Fiber optic line, Nevada Bell	67.0 miles	All (assume within road corridors)	Existing
Ely Westside Rangeland Project	Humboldt Toiyabe National Forest, Ely Ranger District Quinn Canyon, White Pine Range, and Grant Range	DEIS (available 11/07)	Analysis of livestock grazing on 12 allotments in the White Pine, Quinn Canyon, and Grant Ranges		Socio, Land Use, Range	Future
Enexco, Wind Generation Project	North Egan Range	Wind Generation			All but paleo and geology/ minerals/topo	Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Falcon to Gonder 345kV Transmission Project	From Gonder Substation just north of Ely, NV then heads west to ¼ mile south of Thirtymile Substation	Transmission Line	New 345kV transmission line from Falcon to Gonder and expansion of two substations	179 miles	All	Existing
Four Corners Generating Station	Fruitland, NM about 25 miles west of Farmington, NM on the Navajo Reservation	Power Plant	FCGS is one of the largest coal-fired generating plants in the US. IT is a 5-unit 2,040 MW power plant operated by APS. Provides power to NM, AZ, CA, and TX. Online in 1963.		Air Resources**	Existing
Gold Canyon	White Pine County	Mining District	Gold, silver Active mining.		All	Present, Future
Golden Chalice Resources – Aphro Hill Project	Nye County - T9N, R47.5E, Section 36 and T9N, R47E, Sections 25-26.	Mining Exploration	Golden Chalice Resources mineral exploration proposal to drill 9 drill sites and construct 5,005 feet of road; less than 4.3 acres of disturbance.		Socioecon	Future
Gonder to Machacek 230kV Transmission line	¼ mile south of Thirtymile substation site	Transmission Line	230kV transmission line		All	Existing
Granite	White Pine County	Mining District	Lead, silver, gold, tungsten, copper NMC790940		All	Present, Future
Graymont Pilot Peak Lime Plant	West of Wendover, NV on I-80.	Industrial	Lime plant	Capable of producing 300 tons of hydrated lime per day	Air Resources – Cumulative Class I*	Present, Future
BLM Grazing Permits	Range Resources CEA-wide; see Figures 3.9-1a, 3.9-1b, and 3.9-1c	Grazing	The BLM lands within the Range Resources CEA have been grazed and are currently authorized for grazing under the authority of permits issued by the BLM. Currently term permits are being issued and are anticipated to continue to be issued in accordance with Title 43 CFR 4130.2(a), "Grazing permits or leases shall be issued to qualified applicants to authorize use on the public lands and other lands under the administration of the Bureau of Land Management that are designated as available for livestock grazing through land use plans." These permit renewals are based on a determination of achievement of the Standards and Guidelines for grazing, therefore determination changes may or may not be made to these permits.		Water, Vegetation, Wildlife, Range, Cultural Resources, Land Use, Special Designations, Recreation	Past, Present, and Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
H.E. Hunewill Construction Company, Inc.	Wellington, NV	Industrial	Construction, Asphalt, Concrete, Sand, Gravel		Air Resources – Cumulative Class II*	Present, Future
Harry Allen 230kV and 500kV substations/ switchyards	Apex Industrial Park, Clark County, NV	Substation	Two substations located in the vicinity of the Harry Allen Generation Station		All	Existing
Harry Allen Generation Station, Nevada Power	Highway 93 and I-15, Clark County, NV	Power Plant	2 - 75 MW natural gas, simple cycle combustion turbines power plant; planned expansion includes the addition of 2 – 250 MW combined cycle turbines, 500 kV line to connect new generation to substation (approximately ½ mile), and related appurtenances.		Air Resources**, [All]	Existing and Future
Harry Allen to Apex and Silverhawk 500 kV transmission Line	Between Harry Allen and the Apex and Silverhawk Generating stations	Transmission Line	500kV transmission line		All (only because it goes to Harry Allen substation)	Existing
Harry Allen to NW and Harry Allen to Crystal 500kV Transmission lines	Between Harry Allen, Chuck Lenzie Power plant and the existing NW and Crystal substations	Transmission Line	Two 500kV transmission lines		All (only because it goes to Harry Allen substation)	Existing
Harry Allen 230kV Transmission lines	Between Harry Allen, Pecos, & Reid Gardner substations	Transmission Line	Harry Allen to Pecos, Harry Allen to NW, and Harry Allen to Reid Gardner 230kV transmission lines		All (only because it goes to Harry Allen substation)	Existing
Harry Allen to Red Butte transmission line	Between Harry Allen and Red Butte substations	Transmission Line	345kV transmission line		All (only because it goes to Harry Allen substation)	Existing
Harry Allen-Mead 500kV Transmission line – First Circuit	Between Mead Substation, located south of Lake Mead and The Harry Allen Substation northeast of Las Vegas	Transmission Line	500kV transmission line		All (only because it goes to Harry Allen substation)	Existing

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Harry Allen-Mead 500kV Transmission line – Second Circuit	Parallel to First Circuit – Mead Substation to Harry Allen, southwest of Lake Mead	Transmission Line	500kV transmission line		All (only because it goes to Harry Allen substation)	Future
Hidden Valley Community project	Moapa, NV	Community Development	Hidden Valley Glendale LLC's proposed Hidden Vally Community project	910 acres	Land Use, Recreation, Special Designations	Future
Highland	Lincoln County	Mining District	Lead, silver, gold, copper, tungsten, manganese, iron		Range Resources, Socioecon	Present, Future
Homestake Mining, Ruby Hill Mine	2 km northwest of Eureka, NV	Mining Exploration	Open pit gold mine went into operation in 1998, closed in 2002 following exhaustion of mineable reserves, and reclaimed.		Air Resources – Cumulative Class II*	Past
Hunter	White Pine County	Mining District	Lead, copper, silver, gold, uranium Active mining.		All	Present, Future
I-15	Traverses Southeast Nevada	Highway	Four-lane interstate highway and easement		Transportation	Existing
Intermountain Power Project Phase III	Near Delta, Millard County, Utah	Power Plant	Expansion of IPP by adding one 950 MW unit to the existing two coal-fired units that provide 1,900 MW.		Air Resources*	Present and Future
J&M Trucking	2 Locations: Ely, NV Eureka, NV	Industrial	Sand and Gravel, Ready Mix Concrete		Air Resources - Cumulative Class II* [Socio, Land Use]	Present, Future
Kane Springs Valley Water Development Project	Lincoln County	Water Project	Proposed by the Lincoln County Water Conservancy District; would establish a production and distribution system to deliver water to planned developments		All	Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Kennecott water ROW	T18N R64E Sections 2, 10, 11, 15, 22 T19N R64E Sections 25, 35, 36 T19N R65E Section 30	Pipeline	36-inch diameter water pipeline; Assigned from Steptoe Valley Smelting and Mining Co. to Kennecott Nevada Copper Company	68.833	All	Past
Kern River Gas Transmission Company expansion pipeline	From Salt Lake City Utah, terminating at Apex Industrial Park, Clark County, NV	Pipeline	36-inch diameter natural gas pipeline	400 miles	All [Socioecon]	Existing
Lincoln County Land Act Groundwater Development Project	Lincoln County	Water Project	Lincoln County water District proposes to construct groundwater facilities and ancillary utility infrastructure designed to pump and convey groundwater in the Clover Valley and Tule Desert Hydrographic Basins, primarily to meet future municipal needs in southeastern Lincoln County		Water Resources, Soils, Vegetation, Wildlife	Future
Lincoln County Lands Act of 2000	Lincoln County, NV	Lands Legislation	• Disposal of over 13,000 acres of public land • Retention of a portion of the proceeds by the State for general education; • Retention of a portion of the proceeds by the County with an emphasis on support for schools • Retention of a portion of the proceeds by the BLM in special accounts to be used for inventory, evaluation and protection and management of unique archaeological resources; development of a multispecies habitat conservation plan; reimbursement of the State and County for costs associated with sales; and for acquisition of environmentally sensitive land		Land Use, Special Designations, Recreation, Socioecon	Present/ Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Lincoln County Conservation Recreation and Development Act	Lincoln County, NV	Lands Legislation	• Disposal of approximately 100,000 acres of public land • Retention of a portion of the land sale proceeds by the State for the educational fund • Retention of a portion of the proceeds by the county for economic development • Retention of a portion of the proceeds by the BLM in special accounts to be used for inventory, evaluation and protection and management of unique archaeological resources; development of a multispecies habitat conservation plan; reimbursement of BLM costs associated with sales; for management of the Silver State Off-Highway Vehicle Trail; and for management of the wilderness designated by the act. • Designation of nearly 770,000 acres of wilderness. • Release of over 245,000 acres of wilderness study area • Establishment of utility corridors for the Southern Nevada Water Authority and the Lincoln County Water District, and relocation of an existing utility corridor along Highway 93. • Designation of the Silver State Off-Highway Vehicle Trail • Conveyance of nearly 5,000 acres of BLM land to the State and County for use as parks and open space • Transfer of administrative jurisdiction for over 8,000 acres associated with the relocated utility corridor from the USFWS to the BLM, and transfer of over 8,500 acres of land from the BLM to the USFWS near the Desert NWR		Land Use, Special Designations, Recreation, Socioecon	Present/ Future
Lincoln County Power District 2x139kV transmission line	Lincoln and Clark counties within BLM utility corridor	Transmission Line	2x138kV transmission line, single-circuit, or 1x138kV transmission line double-circuit		All	Future
Lincoln County Power District 69kV transmission line	Lincoln and Clark counties within BLM utility corridor	Transmission Line	69kV transmission line		All	Existing
McGill Tailings Reclamation Area	Outside McGill, NV, White Pine County	Mining Tailings	Mine tailings that have been covered with topsoil, seeded and irrigated; now used for limited grazing.	Approx. 3,700 acres	All	Past/Present
MCI Fiber Optic Line	Lincoln and Clark counties within BLM utility corridor	Fiber Optic line	Fiber optic line		All	Existing
Meadow Valley	Lincoln County	Mining District	Gold, silver, uranium		All	Present, Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Mount Wheeler Power Transmission line	Gonder to north along Hwy 93	Transmission Line	69kV transmission line		All	Existing
Mustang Energy project	Near Grants, NM	Power Plant	This proposed plant would be a 300 MW project employing technology to achieve ultra low emission.		Air Resources**	Future
Navajo Generating Station	About 5 miles east of Page, AZ	Power Plant	NGS is a coal-fired power plant with a capacity of 2,250 MW from three 750-MW units. NGS serves customers in AZ, NV, and CA. Online in 1974.		Air Resources**	Existing
NDOT 2007 Highway Improvement Projects	White Pine County	Highway Improvement	• U.S. 93 from Cherry Creek Road to U.S. 93A • FH 23, Duck Creek from U.S. 93 North of McGill for 10.2 miles South, Project Administrator – Forest Service • Ely Colony – Route 102, Project Administrator – Indian Reservation Roads Program • U.S. 93 from 2.64 miles north of Lake Valley Summit roadside Park to U.S. 6 / 50 • SR-318 Sunnyside Road from Nye/White pine County line to U.S. 6 • U.S. 93 from Lincoln/White pine County Line for 11 Miles North • U.S. 6 from the Nye/White Pine County line for 13.92 Miles North • U.S. 50 at 14.85 Miles East of Junction with Ruby Valley Road • U.S. 50 at 17.45 Miles East of Junction with Road to Strawberry (SR-892) • U.S. 50 at 23.45 Miles East of Junction with road to Strawberry • U.S. 50 from 3.45 Miles East of Junction with Ruby Valley Road		Transportation [All more or less]	2007
Nevada BLM Oil & Gas Lease Sales	BLM lands in Nevada	Oil and Gas Exploration	Quarterly competive oil and gas lease sale. Initial step in the search for oil and gas. Subsequent actions to leasing parcels are exploration, development, production of oil and gas, and eventual abandonment plugging of wells and reclamation of the site		All	Past, present, future
Nevada Cogen #1 Chevron and Northern Star Generating	Apex Industrial Park, Clark County, NV	Power Plant	85 MW natural gas plant that provides electrical power to Nevada Power and thermal heat to Georgia Pacific, for gypsum board production		Air Resources**, Land Use, Recreation, Special Designations	Existing
Nevada Northern Railway Rehabilitation	Elko and White Pine Counties	Railway	Rehabilitation/reconstruction of the existing Nevada Northern Railway	150 Miles	All	Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Nevada Slag, Inc.	McGill, NV	Industrial	Specialty Sandblasting, Abrasives		Air Resources – Cumulative Class II*	Present, Future
Nevada Wind Co & LS Power - Egan Range Wind Generating Project	Egan Mountain Range near Telegraph Peak	Wind Generation	A maximum of 200 wind turbine generators, with a maximum nominal design capacity of 1,800 MW. The wind turbine generators would be supported on 140 to 328 foot tall conical tubular steel towers with a foundation diameter of 15 feet. In addition, 32 miles of new power line from the proposed Egan Range Wind Generating Facility substation to the Gonder substation would be constructed		All but paleo and geology/ minerals/topo	Future
Nevada Wind Co & LS Power – Wind Generating Project in the Antelope Range	Northeast portion of the Steptoe Valley and South Schelle Creek Range	Wind Generation			All but paleo and geology/ minerals/topo	Future
Nevco Sigurd Power Plant	Sigurd, UT	Power Plant	Proposed 270 MW coal-fired, air-cooled power plant.		Air Resources*	Future
Newark Valley to Ely fiber optic line	White Pine County, in Hwy 50 ROW in Newark Valley, Long Valley, Jake's Valley, and Steptoe Valley	Fiber Optic Line	Fiber optic line	75.2 miles	All	Existing
Newmont Gold Coal-Fired Power Plant	Near Elko, NV	Power Plant	Construction of 200 MW coal-fired power plant near the Carlin Trend gold producing area. Construction began in 2006, plant online in 2008.		Air Resources**	Present and Future
Pasco Canyon Exploration Project	Nye County - Section 31, T12N, R46E and Section 36, T12N, R45E.	Mining Exploration	Piedmont Mining Co. Inc. proposal to drill 6 reverse circulation holes for minerals exploration.		Socioecon	Future
Pequop	Elko County	Mining District	Phosphate, barite		[All]	Present, Future
Proctor	Elko County	Mining District	Tungsten, silver, copper, limestone		Range, Socioecon, Land Use	Present, Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Proposed Lower Meadow Valley Wash ACEC	BLM Ely F.O. , Lincoln County, NV	ACEC Designation	This ACEC is included under the preferred alternative in the Final RMP for the Ely FO. The ACEC would be partly located along the UPRR south of Caliente		Socio, Range, Land Use, Special Designations	Future
Reck Brothers	Ely, NV	Industrial	General engineering contractor specializing in asphalt paving		Air Resources – Cumulative Class II* [Socio, Land Use]	Present, Future
Reed Distributing	Ely, NV	Industrial	Oil and Gas Distributing		Air Resources - Cumulative Class II* [Socio, Land Use]	Present, Future
Reid Gardner Expansion	Moapa, Clark County, NV	Power Plant	Expansion for evaporation ponds and permanent storage yard for fly ash	240 acres for fly ash landfill 315 acres for evaporation ponds	Air Resources*	Future
Reid Gardner Station	Moapa, NV	Power Plant	650 MW coal-fired power plant		Air Resources*	Existing
Robinson	White Pine County	Mining District	Copper, gold, silver, zinc, lead, iron, manganese, tungsten, molybdenum, rhenium, platinum, palladium, nickel NMC484174		Water Resources, Geology & Minerals, Range Resources, Socioecon	Present, Future
Ruby Hill	White Pine County	Mining District	Silver		All	Present, Future
Rural and suburban residential development	Throughout project area	Community Development	Rural and urban residential development, both individual residence and large-scale development		All	Existing and Future
Sacramento Pass Hazardous Fuels Reduction Project	South and east of Highway 50 near Sacramento Pass, White Pine County, NV, near the UT border	Prescribed Burn	Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing not to exceed 1,000 acres. Such activities shall be limited to areas (1) in wildland-urban interface and (2) Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside of the wildland-urban interface	burning up to 4,500 acres; mechanical methods up to 1,000 acres	Air Resources**, Land Use, Special Designations, Recreation, Socioecon	categorical exclusion issued June 2007

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Salisbury Peak Minerals Exploration	Nye County – T8N, R44E, Section 16	Mining Exploration	Round Mountain Gold Corporation exploration proposal to drill up to 16 holes on existing roads, blade up to 800 ft of existing roads, and construct up to 2, 080 ft of new road. Total surface disturbance of approximately 1.7 acres		Socioecon	Future
San Francisco	White Pine County	Mining District	Silver, lead Active mining.		All	Present, Future
San Juan Generating Station	About 15 miles northwest of Farmington, NM	Power Plant	Operated by PNM, the power plant consists of four coal-fired, pressurized units that generate about 1,800 MW of electricity. Online in 1973. It is the seventh-largest coal-fired generating station in the West.		Air Resources**	Existing
Schellbourne	White Pine County	Mining District	Silver, tungsten Active mining.		All	Present, Future
Silver Canyon	White Pine County	Mining District	Copper, gold, lead, silver		All	Present, Future
Silver King	Lincoln County	Mining District	Silver, lead, gold, copper		Range, Socioecon	Present, Future
Silver State East fiber optic line	Reno to SLC, UT along Hwy 50 ROW	Fiber Optic Line	Fiber optic line within ROW		All	Existing
Silverhawk Power Plant, Nevada Power	Apex Industrial Park, Clark County, NV	Power Plant	570 MW natural gas, combined cycle power plant		Air Resources**, Land Use, Recreation, Special Designations	Existing
SNWA 230kV transmission line	White Pine, Lincoln, and Clark Counties within BLM utility corridor	Transmission Line	230kV Transmission line		All	Future
SNWA water pipeline	White Pine, Lincoln, and Clark Counties within BLM utility corridor	Water Project	Water pipeline system		Water Resources, Soils, Vegetation, Wildlife	Future
Southern Nevada Public Lands Management Act	Clark County, NV	Lands Legislation	Provides for disposal of identified tracts of public lands with proceeds retained by local agencies.		Land Use, Special Designations, Recreation, Socioecon	Present/ Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Southern Nevada Water Authority, Vidler, Lincoln County Water District and interrelated water projects	Central Lincoln, eastern White Pine, and northern Clark Counties	Water Project	Interrelated water projects concerning deep and shallow aquifer developments and pipelines in and through the two counties. Proposed intention to develop and convey up to 200,000 acre-feet per year of groundwater from seven hydrographic basins.		Ground Water, Surface Water, Socio, Land Use [All]	Future
Southwest Intertie Project, Southern Portion NV-040-07-048	Clark County White Pine County, NV	Transmission Line	Two modifications to the SWIP project: an extension of the ROW and 500kV transmission line for 4 miles to the Harry Allen substation in Clark County; and a modification of the ROW grant in the Robinson Summit area to shift substation location to the west slightly	3.8 mile extension 77 acre substation site	All [Socioecon]	Future
Southwest Intertie Project (SWIP)	Gonder substation to Harry Allen substation	Transmission Line	The areas potentially affected by this amendment to Right-of-Way Grant NVN-49781 consist of a 3.8-mile extension from the originally approved terminus of the SWIP to the existing Harry Allen 500kV Substation in Clark County and the relocation of the originally approved Robinson Summit Substation site approximately ¾ mile to the northwest, and immediately adjacent to the approved SWIP corridor in White Pine County (the relocated site is referred to as the Thirtymile Substation). The proposed extension would involve an interconnection at the existing Harry Allen 500kV Substation in an area that has been previously modified by several energy related facilities including generation and substation facilities, and numerous transmission lines. The proposed relocated substation would involve an amount of disturbance to BLM land similar to or less than the previously approved site (approximately 77 acres), immediately adjacent to a designated utility corridor.	77 acres beyond previous approvals	All	FONSI issued August 2007
SPPC 230kV transmission line	To Gonder substation, parallels US 50	Transmission Line	230kV Transmission line		All	Existing
SPPC/NPC 500kV transmission lines	White Pine, Lincoln, and Clark Counties within BLM utility corridor	Transmission Line	Two 500kV transmission lines		All	Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Spruce Mountain Restoration Project	approx 30 miles south of Wells Elko County	Range Improvement	Elko Field Office, in cooperation with the Nevada Department of Wildlife (NDOW), proposes a series of hazardous fuel reduction and habitat restoration treatments over a five to seven-year period in the Spruce Mountain area in southeastern Elko County. The project area encompasses approximately 552,000 acres within the Spruce Allotment, from Ruby Valley on the west side to the crest of the Goshute Mountains on the east. This project would treat up to 16,000 acres of pinyon-juniper woodlands and adjacent mixed conifer or sagebrush communities to protect and improve wildlife habitat, including crucial mule deer winter range.	16,000 acres of pinyon-juniper treated in project area of 552,000 acres	Range, Vegetation, Soils [All]	scoping in progress
Telegraph	White Pine County	Mining District	Gold, tungsten Active mining.		All	Present, Future
Toano Fuelbreak	I-80 Shafter exit north to SR233 near Cobre, Elko County, NV	Fire Break	BLM is proposing to construct and maintain a fuelbreak across public lands along the western edge of the Toano Range. The purpose of the treatment is help limit the spread of a human caused ignition along I-80 and SR 233 corridors and protect wildlife habitat, including crucial deer winter range. The fuelbreak would be constructed using a mechanical mower. It would be a minimum of 300-500 feet wide, with an approximately length of 11 miles.	300-500 feet wide by eleven miles	Range Land Use [Socio]	in design
Toquop Energy Project	about 12 miles northwest of Mesquite, NV, and 50 miles south-southeast of Caliente.	Power Plant	The company proposes to construct a 750 MW coal-fired power plant in the same location as the previously proposed natural gas-fired power plant. Newer technology has increased the efficiency of modern coal-fired plants and provides a more stable cost basis for power than natural gas. In addition, the coal-fired power plant would decrease the water use requirements substantially from those of the previously permitted project. A rail would be used to transport coal to site, crossing about 31 miles of BLM land; Disturbance of rangeland, socioeconomic factors, particulate emissions Impacts on recreation and access; visual and biological resources; noise; geology, soils, and minerals; archaeology and historic preservation; public safety; hazardous materials, and solid waste were considered minimal under the previous EIS.	640 acres of public land (to be sold); 100 ft by 31 mi ROW for rails; ROW for water pipeline and access road (approved in 2003) Pipeline 356 Railroad 698	Air Resources**, Socioecon, Land Use	Future
TransCanada (Northern Lights) 500kV transmission line	Eastern Montana to Las Vegas within BLM utility corridor	Transmission Line	500kV DC transmission line		All	Future
TransCanada (Northern Lights) 500kV transmission line	Wyoming to Las Vegas within BLM utility corridor	Transmission Line	500kV DC transmission line		All	Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
U.S. Army – Dugway Proving Ground	Western Tooele County, Utah	Military	Military activities		Air Resources – Cumulative Class II*	Present, Future
UNEV Pipeline	From Salt Lake City Utah, terminating at Apex Industrial Park, Clark County, NV	Pipeline	12-inch diameter oil pipeline	400 miles	All [Socioecon]	Future
UPRR	Traverses through east Lincoln and Clark counties from Utah border west and south to Las Vegas into California	Railway	Mainline railroad track, access road, and future addition of second track		Socio Land Use Transportation	Existing and Future
US Hwy 50	Traverses east-west through central Nevada	Highway	Two-lane US highway		Transportation All	Existing
US Hwy 6	Traverses generally east-west through Nevada	Highway	Two-lane US highway		Transportation	Existing
US HWY 93	Traverses Eastern portion of Nevada	Highway	US highway		Transportation All	Existing
Virgin and Muddy Rivers Surface Water Development Project	Clark County	Water Project	SNWA has proposed to build facilities to divert, treat, and transmit its existing surface water rights on the Virgin and Muddy Rivers to the Las Vegas Valley. SNWA has applied for rights-of-way from the BLM. Due to the 2006 Basin States Agreement regarding the Colorado River, SNWA has agreed to temporarily forego development of Virgin River water rights. However SNWA is continuing with the necessary environmental studies associated with acquiring a BLM right-of-way.		Ground Water, Surface Water, Socio, Land Use [All]	Future (2013)
Western Elite Landfill and Quarry	West of US-93 and east of the proposed SWIP realignment, approx. 5 miles north of the Lincoln/Clark county line	Landfill & Quarry	Landfill and quarry operation	Portions of Sections 24 and 25, T 11S, R 62 E. 83 Acres – landfill only	All	Existing

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
West-wide Energy Corridor Program	throughout Nevada, including EEC project corridor	Transmission Line	The Energy Policy Act of 2005 directs the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior to designate under their respective authorities corridors on federal land in 11 Western States for oil, gas and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors).	Proposed for Nevada are 1,630 miles of corridor on 925,051 acres, of which 46 % is existing utility & trans. ROWs.	All	DPEIS available – Public comment period ends February 14, 2008
White Pine & Grant-Quinn Oil and Gas Leasing	in Western White Pine, eastern Nye, and western Lincoln counties	Oil and Gas	Oil and Gas leasing program with mitigations and modified to omit inventoried roadless areas (IRAs) and other restrictions	255,603 ac of National Forest System Lands	Air Resources*, Socioecon, Range, Land Use	ROD issued August 2007
White Pine County Conservation, Recreation, and Development Act of 2006	White Pine County	Lands Legislation	• Disposal of approximately 45,000 acres of BLM lands • Designation of approximately 558,000 acres of wilderness • Release of over 54,000 acres of wilderness study areas • Allow for land transfers to protect areas around Great Basin NP and expand two Nevada State Parks • Study of an off-highway vehicle trail • Transfer of lands into trust for the Ely Shoshone Tribe • Amendments to the SNPLMA • Funding of All-American Canal Projects, in return for which Nevada would be guaranteed the right to divert and consume a portion of water from Lake Mead		Land Use, Special Designations, Recreation, Socioecon	Existing/ Future
White Pine County Public Works Pit	White Pine County, NV, Sec 31, T17N. R64E	Industrial	Sand, sand/gravel, crushing, screening		Geology & Minerals [All]	Present, Future
White Pine County School district	Ely, NV	Power Plant	Biomass boiler to provide heat at Norman Elementary School		Air Resources – Cumulative Class II*	Present, Future
White Pine Energy Station	White Pine County, NV	Power Plant	1,500 MW coal-fired power plant		Air Resources*, All	Future
Willow Canyon Minerals Exploration	Nye County – T14N, R45E, Sections 11, 14	Mining Exploration	Steven Warr and Associates minerals exploration proposal involving up to 3 trenches on existing roads in a previously disturbed area. Surface disturbance less than 1 acre.		Socioecon	Future

Project	Location (County, T/R Section, etc.)	Project Type	Brief Description	Acreages or other Quantity	Analyzed Within Resource Topic	Status
Winters Fire Emergency Wild Horse Gather	T29N R65E Section 25, northwestern portion of Elko County, near Midas	Wild Horse	Emergency wild horse gather on lands affected by the Winters Fire. Approximately 450 horses gathered; 100 relocated, remaining placed for adoption.		All	2006 Past
WPEA/GBT 500kV Transmission Line	White Pine County (located within BLM utility corridor)	Transmission Line	500kV transmission line		All	Future project as of 8/07
Yelland Field (White Pine County Airport) Expansion	Northeast of Ely, NV on Highway 93	Airport	Conveyence of approximately 1,545 acres of public land to county. Lengthening runway by approximately 5000 feet. Construction of hangars and fencing.		Air Resources**, Land Use, Special Designations, Recreation, Socioecon	Future
Yucca Mountain - DEIS for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain	Caliente, NV to Amargosa Valley, circumnavigatin g the Nevada Test Range to the west, through Lincoln & Nye Counties	EIS	Supplemental DEIS to an EIS for a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain.		All	Future

*Included in the quantitative air quality impact modeling analyses.
**NOT included in the quantitative air quality impact modeling analyses.

BLM Mission Statement

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.